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BUILDING-LAW

OF THE

TOWN OF BROOKLINE

TOGETHER WITH THE

Regulations for Gas Fitting

AND THE

By-Law and Regulations relative to Wires and Lights

BROOKLINE, MASS.:
THE RIVERDALE PRESS: C. A. W. SPENCER
1903

BUILDING-LAW

OF THE

TOWN OF BROOKLINE

Adopted March 31, 1903
Approved by the Superior Court
May 11, 1903

INCORPORATED
1705

BROOKLINE, MASS.:
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BY-LAW

IN RELATION TO THE

CONSTRUCTION OF BUILDINGS

IN THE

TOWN OF BROOKLINE, MASS.

ARTICLE I.

SHORT TITLE OF THIS BY-LAW.

SECTION 1. This By-Law to be Known and Cited as the Building Law. — The following provisions shall constitute and be known as the building law, and may be cited as such, and presumptively provides for all matters concerning, affecting or relating to the construction, repair, alteration or removal of buildings or structures erected or to be erected in the town of Brookline.

SECTION 2. Building Law to be Construed Liberally. — This by-law is hereby declared to be remedial, and is to be construed liberally, to secure the beneficial interests and purposes thereof.

ARTICLE II.

PRELIMINARY REQUIREMENTS.

SECTION 1. New Buildings and Buildings to be Altered. — No wall, structure, building, or part thereof, shall hereafter be built or constructed, nor shall the plumbing, drainage, or ventilation, of any building, structure or premises, be constructed or altered in the town of Brookline except in conformity with the provisions of this law. No building already erected, or hereafter to be built, in said town, shall be raised, altered, repaired, moved or built upon in any manner, that would be in violation of any of the provisions of this law, or the approval issued thereunder.

SECTION 2. Filing Plans and Statements. — Before the erection, construction, repair, alteration, demolition of any building or part of any building, structure or part of any structure, or wall, or any platform, staging, or flooring to be used for standing or seating purposes, and before the construction or alteration of the plumbing, drainage, or ventilation of any building, structure, or premises is commenced, the owner, or lessee, or agent of either, or the architect or builder employed by said owner, or lessee, in connection with the proposed erection or alteration, shall file with the commissioner a detailed statement of the specifications on appropriate blanks to be furnished to applicants by the building department, and a full and complete copy of the plans of such proposed work, and such structural detailed drawing of the said proposed work as the commissioner may require, all of which, if the commissioner so requires, shall be accompanied with a statement in writing, sworn to before a notary public, commissioner of deeds, or justice of the peace, giving the full name and residence, street and number, of the owner, or of each of the owners of said building, or proposed building, structure, or proposed structure, premises, wall, platform, staging, or flooring. If such erection, construction, or alteration, plumbing, drainage, or ventilation, or the alteration thereof, is proposed to be made or executed by any other person than the owner or owners of the land in fee, the person or persons intending to make such erection or alteration, or to construct such plumbing, drainage, or ventilation, shall accompany said detailed statement of the specifications and copy of the plans with a statement in writing, sworn to as aforesaid, if the commissioner so requires, giving the full name and residence, street and number, of the owner or owners of the land, or proposed building, structure, or proposed structure, premises, wall. platform, staging, or flooring either as owner, lessee, or in any other representative capacity, and that he or they are duly authorized to perform said work. Such statement may be made by the agent or architect of the person or persons hereinbefore required to make the same. Said sworn statement, and detailed statement of specifications, and copy of the plans shall be kept on file in the office of the commissioner, and the erection, construction, or alteration of said building, structure, wall, platform, staging, or flooring, or any part thereof, and the construction, or alteration of the said plumbing, drainage, or ventilation shall not be commenced or proceeded with, until said statements and plans shall have been so filed and approved by the commissioner, and the erection, construction or alteration of such building, structure, platform, staging, or flooring, and the construction or alteration of such plumbing, drainage, or ventilation when proceeded with shall be constructed in accordance with such approved detailed statement of specifications and copy of plans, and such plans shall be exhibited on demand to any of the officers of the building department. Nothing in this section shall be construed to prevent the commissioner from granting his approval for the erection of any part of a building, or any part of a structure, where plans and detailed statements have been presented for the same before the entire plans and detailed statements of said building or structure have been submitted. Any approval which may be issued by the commissioner pursuant to the provisions of this section, but under which no work is commenced within one year from the time of issuance, shall expire by limitation. Ordinary repairs of buildings or structures, or of the plumbing, drainage or ventilation thereof, may be made without notice to the building department, but such repairs shall not be construed to include the cutting away of any stone or brick wall, or any portion thereof, the removal or cutting of any beams or supports, or the removal, change or closing of any staircase, or the alteration of any house sewer or private sewer or drainage system, or the construction or alteration of any soil or waste pipe. The foregoing provisions and all the provisions of this law shall apply with equal force to buildings, both municipal and private. This law shall not apply to bridges, quays, or wharves, or to buildings belonging to or ceded to the United States or to the Commonwealth of Massachusetts. It shall be the duty of the commissioner to approve or reject any plan filed with him pursuant to the provisions of this section within a reasonable time.

SECTION 3. Demolishing Buildings. — When plans and detailed statements are filed in the building department for the erection of a new building, if an existing building or part of an existing building is to be demolished, such fact shall be stated in the statement so filed. In demolishing any building, story after story shall be completely removed. No material shall be placed upon the floor of any such building in the course of demolition, but the brick, timbers and other structural parts of each story shall be lowered to the ground immediately upon displacement. The owner, architect, builder or contractor for any building, structure, premises, wall, platform, staging or flooring to be demolished shall give not less than twenty-four hours' notice to the building department of such intended demolition. If work upon any building shall be conducted in violation of any of the provisions of this law, either as to occupation of sidewalks or streets or the use or application of material of workmanship, the commissioner shall revoke the permit for the building operation in connection with such violation. It shall be unlawful, after the revocation of such permit, to proceed with such building operations, unless the permit shall have been reissued by the commissioner. Before a permit, revoked for the cause or causes before mentioned, can be lawfully reissued, the entire building and building site must be put into condition corresponding with the terms of this law, and any work or materials applied to the building in violation of the terms of this law shall be removed.

ARTICLE III.

DEFINITIONS OF TECHNICAL TERMS.

Adjoining Owner. — The owner or one of the owners of the premises adjoining those under consideration.

Alteration. — Any change or addition.

Apartment House. — An apartment house is a building divided into suites of rooms, each suite intended for the residence of one family and containing the conveniences of a modern dwelling, including facilities for cooking. — Also see Tenement House.

Appendages. — Dormer windows, cornices, mouldings, bay windows, towers, spires, ventilators, piazzas, and other projections.

Areas. — Open spaces adjacent to building or the building line, for lighting or ventilating.

Bay Window. — A window above the first floor, projecting from the outer face of the wall.

Basement. — Basement is a story partly, but not more than one-half, below the level of the sidewalk.

Builder. — The person who is employed to build or to execute work on a building or structure, or where no person is so employed the owner of the building or structure.

Bearing Wall. — A wall on which beams, trusses, or girders rest.

Building. — Anything erected by art, and fixed upon or in the soil, composed of different pieces connected together, and designed for use in the position in which it is so fixed.

Building Line. — A line between which and a street, way, or place no building can be erected or placed.

Building Owner. — The owner of the building or premises under consideration.

Building of the First Class. — A building of fireproof construction throughout.

Building of the Second Class. — A building not of the first class, the external and party walls of which are of brick, stone, iron, or other equally substantial and incombustible materials.

Building of the Third Class. — Any building not of the first or second class.

Cellar. — A lower story of which more than one-half of the height from the upper surface of the floor to the under side of the floor joists of the story next above is below the mean grade of all the streets, or the mean grade of the natural ground adjoining the building: provided, that said grade of the ground is not below the grade of the street at the principal front.

Composite Building. — A building part second class and part third class construction: provided, that the portion constructed second class conforms to all the requirements of law relating to second class buildings of like character or use, and the portion constructed third class conforms to all requirements of law relating to third class buildings of like character or use.

Commissioner. — The building commissioner of the town of Brookline.

Cubical Extent. — Applied to the measurement of a building means the space contained within the external surfaces of its walls and roof and the upper surface of its lowest floor.

Dwelling House. — A building used or constructed or adapted to be used wholly or principally for human habitation.

External Wall. — Every outer wall or vertical enclosure of any building other than a party wall.

Factory. — Any premises where steam, water or other mechanical power is used in aid of any manufacturing process there carried on.

Foundation. — That portion of a wall below the level of the street curb, or, where the wall is not on a street, means that portion of the wall below the level of the highest ground next to the wall; but foundations of party or partition walls may be construed by the commissioner to mean that portion below the cellar floor.

Height of a Building. — The vertical distance of the highest point of the roof above the mean grade of the curbs of all the streets or the mean grade of the natural ground adjoining the building, if the said grade of ground is not below the grade of the curb.

Height of a Wall. — The height from the mean grade of the ground adjoining the wall, to the highest point of the wall.

Hotel. — Every building, or part thereof, intended, designed or used for supplying food and shelter to residents or guests, and having a general public dining-room or a café, or both, and containing also more than fifteen sleeping-rooms above the first story.

Lodging House. — A hotel or other building in which persons are accommodated with sleeping apartments, and in which cooking is not done in the apartments.

Measurement for Width of Building. — For the purposes of this law, the greatest linear dimension of any building shall be considered its length, and the next greatest linear dimension its width.

Mansard Roof. — A roof formed with an upper and under set of rafters, the upper set more inclined to the horizon than the lower set.

Office Building. — Every building which shall be divided into rooms above the first story, and be intended and used for business purposes, and no part of which shall be used for living purposes, excepting only for the janitor and his family.

Owner. — As applied to a building or land shall include any part owner, joint owner, tenant in common, or joint tenant of the whole or of a part of such building or land.

Partition Wall. — Any interior wall in a building.

Party Wall. — A wall forming part of a building and used or constructed to be used for separation of adjoining buildings.

Private Dwelling. — Every building which shall be intended or designed for, or used as, the home or residence of not more than one family or household, and no part of which structure is used as a store or for any business purpose.

Public Building. — A building used or constructed or adapted to be used as a church, chapel, or other place of public worship, or as a school, college, or as a hospital, workhouse, public theatre, public hall, public concert-room, public ballroom, public lecture-room, public library, or public exhibition-room, or as a public place of assembly, or used or constructed or adapted to be used for any other public purpose.

Repairs. — The reconstruction or renewal of any part of a building, or of its fixtures or appurtenances, by which the strength or fire risk is not affected or modified, and not made for the purpose of converting the building in whole or in part to a new one.

Schoolhouse. — Any building or premises in which public or private instruction is afforded to not less than ten pupils at one time.

Structure. — Any building, wall, or other structure, and anything affixed to or projecting from any building, wall, or other structure.

Story of a Building. — A division in a building comprising the space between two successive tiers of joists.

First Story. — That story of a building to which there is an entrance from the outside on or near the level of the ground, and where there are two such stories then the lower story of the two: provided, that no story of which the upper surface of the floor is more than four feet below the level of the adjoining pavement shall be deemed to be the first story.

Second Story. — That story of a building which is next above the first story, the successive stories above the second story being the third story, the fourth story, and so on to the topmost story.

Topmost Story. — The uppermost story in a building, whether constructed wholly or partly in the roof or not.

Tenement House. — Any house or building any portion of which is rented, leased, let, or hired out to be occupied as the home or residence of three families or more living independently of each other and doing their cooking upon the premises, or by two or more families above the first story so living and cooking, but having a common right in the halls, stairways, yards, water closets or privies, or some of them.

Theatre. — A building or portion of a building in which it is designed to make a business of the presentation of dramatic, operatic or other performances or shows for the entertainment of spectators, and having a permanent stage for said performances which can be used for scenery and other stage appliances.

Thickness of a Wall. — The minimum thickness of such wall.

Workshop. — Any premises, room, or place, not being a factory as above defined, wherein any manual labor is exercised by way of trade or for purposes of gain or as incidental to any process of making, altering, repairing, ornamenting, finishing or adapting for sale any article or part of articles, and to which or over which premises, room or place, the employer of the persons working therein has the right of access or control: provided, however, that the exercise of such manual labor in a private house or private room by the family dwelling therein or by any of them, or in case a majority of the persons therein employed are members of such family, shall not of itself constitute such house or room a workshop within this definition.

Wooden Frame Building. — Any building of which an external wall is constructed wholly or partly of wood. Wood frames covered with metal shall be deemed to be wood structures.

ARTICLE IV.

QUALITY, CALCULATIONS, AND STRENGTH OF MATERIAL.

Section 1. When second-hand material is to be used, that fact shall be stated in the application filed, and no second-hand material shall be used until it has been approved by the building department.

Section 2. All brick used in all buildings shall be of good quality hard burned, and all brick used in external and in external party walls shall be of best quality hard burned. When old brick are used in any wall they shall be thoroughly cleaned before being used, and shall be good, hard, well-burnt brick. No old brick shall be used in external walls without the approval of the commissioner.

Section 3. Sand. — The sand used for mortars in all buildings shall be clean, sharp grit sand, free from loam or dirt, and shall not be finer than the standard samples kept in the office of the building department.

Section 4. Lime Mortar. — Lime mortar shall be made of one part of lime and not more than four parts of sand. All lime used for mortar shall be thoroughly burnt, of good quality, and properly slaked before it is mixed with the sand.

SECTION 5. Cement Mortar. — Cement mortar shall be made of cement and sand in the proportion of one part of cement and not more than three parts of sand, and shall be used immediately after being mixed. The cement and sand are to be measured and thoroughly mixed before adding water. Cements must be very finely ground and free from lumps. Cements classed as Portland cement shall be considered to mean such cement as will, when tested neat, after one day set in air, be capable of sustaining without rupture a tensile strain of at least 120 pounds per square inch, and after one day in air and six days in water be capable of sustaining without rupture a tensile strain of at least 300 pounds per square inch. Cements other than Portland cement shall be considered to mean such cement as will, when tested neat, after one day set in air, be capable of sustaining without rupture a tensile strain of at least 60 pounds per square inch, and after one day in air and six days in water be capable of sustaining without rupture a tensile strain of at least 120 pounds per square inch. Said tests are to be made under the supervision of the commissioner, at such times as he may determine, and a record of all cements answering the above requirements shall be kept for public information.

SECTION 6. Cement and Lime Mortar. — Cement and lime mortar mixed shall be made of one part of lime, one part of cement and not more than three parts of sand to each.

SECTION 7. Concrete. — Concrete for foundation shall be made of at least one part of cement, two parts of sand and five parts of clean broken stone, of such size so as to pass in any way through a two-inch ring, or good clean gravel may be used in the same proportion as broken stone. The cement, sand and stone or gravel shall be measured and mixed as is prescribed for mortar. All concrete when in place shall be properly rammed and allowed to set without being disturbed.

SECTION 8. Quality of Timber. — All timbers and wood beams used in any building shall be of good sound material free from rot, large and loose knots, shakes or any imperfection whereby the strength may be impaired, and be of such size and dimensions as the purposes for which the building is intended require.

SECTION 9. Tests of New Materials. — New structural material of whatever nature shall be subjected to such tests to determine its character and quality, as the commissioner shall direct; the tests shall be made under the supervision of said commissioner, or he may direct the architect or owner to file with him a certified copy of the results of tests, such as he may direct shall be made.

Section 10. Structural Material. — Wrought Iron. — All wrought iron shall be uniform in character, fibrous, tough and ductile. It shall have an ultimate tensile resistance of not less than 48,000 pounds per square inch, an elastic limit of not less than 24,000 pounds per square inch, and an elongation of twenty per cent. in eight inches, when tested in small specimens.

Steel. — All structural steel shall have an ultimate tensile strength of from 54,000 pounds to 64,000 pounds per square inch. Its elastic limit shall be not less than 32,000 pounds per square inch, and a minimum elongation of not less than twenty per cent. in eight inches. Rivet steel shall have an ultimate strength of from 50,000 to 58,000 pounds per square inch.

Cast Steel. — Shall be made of open hearth steel, containing one-quarter to one-half per cent. of carbon, not over eight one-hundredths of one per cent. of phosphorus, and shall be practically free from blow-holes.

Cast Iron. — Shall be of good foundry mixture, producing a clean, tough, gray iron. Sample bars, five feet long, one inch square, cast in sand moulds, placed on supports four feet, six inches apart, shall bear a central load of 450 pounds before breaking. Castings shall be free of serious blow-holes, cinder spots and cold shuts. Ultimate tensile strength shall be not less than 16,000 pounds per square inch when tested in small specimens.

Section 11. Safe Load for Masonry Work. — The safe bearing load to apply to brickwork shall be taken at eight tons per superficial foot, when lime mortar is used; eleven and one-half tons per superficial foot when lime and cement mortar mixed is used; fifteen tons per superficial foot when cement mortar is used. The safe bearing load to apply to rubble-stone work shall be taken at ten tons per superficial foot when Portland cement is used; when cement other than Portland is used, eight tons per superficial foot; when lime and cement mortar mixed is used, seven tons per superficial foot, and when lime mortar is used, five tons per superficial foot. The safe-bearing load to apply to concrete when Portland cement is used shall be taken at fifteen tons per superficial foot, and when cement other than Portland is used, eight tons per superficial foot.

Section 12. Weights of Certain Materials. — In computing the weights of walls, a cubic foot of brickwork shall be deemed to weigh 115 pounds. Sandstone, white marble, granite and other kinds of building stone shall be deemed to weigh 170 pounds per cubic foot.

Section 13. Computations for Strength of Materials. — The dimensions of each piece or combination of materials required shall be ascertained by computation according to the rules prescribed by this law.

SECTION 14. **Factors of Safety.** — Where the unit stress for any material is not prescribed in this code, the relation of allowable unit stress to ultimate strength shall be as one to four for metals subjected to tension or transverse stress; as one to six for timber, and as one to ten for natural or artificial stones and brick or stone masonry. But whereever working stresses are prescribed in this law, varying the factors of safety hereinabove given, the said working stresses shall be used.

SECTION 15. **Strength of Columns.** — In columns or compression members with flat ends of cast iron, steel, wrought iron or wood, the stress per square inch shall not exceed that given in the following tables:

When the length divided by least radius of gyration equals	Working stresses per square inch of section		
	Cast iron.	Steel.	Wrought iron.
120	.....	8,240	4.400
110	.....	8,820	5,200
100	.....	9,400	6,000
90	.....	9,980	6,800
80	.....	10,560	7,600
70	9,200	11,140	8,400
60	9,500	11,720	9,200
50	9,800	12,300	10,000
40	10,100	12,880	10,800
30	10,400	13,460	11,600
20	10,700	14,040	12,400
10	11,000	14,620	13,200

And in like proportion for intermediate ratios.

When the length divided by the least diameter equals	Working stresses per square inch of section.		
	Long leaf yellow pine.	White pine, Norway pine, spruce.	Oak.
30	460	350	390
25	550	425	475
20	640	500	560
15	730	575	645
12	784	620	696
10	820	650	730

And in like proportion for intermediate ratios. Five-eighths the values given for white pine shall also apply to chestnut and hemlock posts. For locust posts use one and one-half the value given for white pine.

Columns and compression members shall not be used having an unsupported length of greater ratios than given in the tables. Any column eccentrically loaded shall have the stresses caused by such eccentricity computed, and the combined stresses resulting from such eccentricity at any part of the column, added to all other stresses at that part, shall in no case exceed the working stresses stated in this law.

The eccentric load of a column shall be considered to be distributed equally over the entire area of that column at the next point below at which the column is securely braced laterally in the direction of the eccentricity.

SECTION 16. Working Stresses. — The safe carrying capacity of the various materials of construction (except in the case of columns) shall be determined by the following working stresses in pounds per square inch of sectional area:

COMPRESSION (DIRECT).

Rolled steel	16,000
Cast steel	16,000
Wrought iron	12,000
Cast iron (in short blocks)	16,000
Steel pins and rivets (bearing)	20,000
Wrought iron pins and rivets (bearing)	15,000

	With grain.	Across grain.
Oak	900	800
Yellow pine	1,000	600
White pine	800	400
Spruce	800	400
Locust	1,200	1,000
Hemlock	500	500
Chestnut	500	1,000

Concrete (Portland) cement, 1; sand, 2; stone, 4	230
Concrete (Portland) cement, 1; sand, 2; stone, 5	208
Concrete, Rosendale, or equal, cement, 1; sand, 2; stone, 4	125
Concrete, Rosendale, or equal, cement, 1; sand, 2; stone, 5	111
Rubble stonework in Portland cement mortar	140
Rubble stonework in Rosendale cement mortar	111
Rubble stonework in lime and cement mortar	97
Rubble stonework in lime mortar	70
Brickwork in Portland cement mortar; cement, 1; sand, 3	250
Brickwork in Rosendale, or equal, cement mortar: cement, 1; sand, 3	208

Brickwork in lime and cement mortar: cement, 1; lime, 1; sand, 6	160
Brickwork in lime mortar: lime, 1; sand, 4	111
Granites (according to test)	1,000 to 2,400
Greenwich stone	1,200
Gneiss (New York City)	1,300
Limestones (according to test)	700 to 2,300
Marbles (according to test)	600 to 1,200
Sandstones (according to test)	400 to 1,600
Bluestone, North River	2,000
Brick (Haverstraw, flatwise)	300
Slate	1,000

TENSION (DIRECT).

Rolled Steel	16,000
Cast Steel	16,000
Wrought iron	12,000
Cast iron	3,000
Yellow pine	1,200
White pine	800
Spruce	800
Oak	1,000
Hemlock	600

SHEAR.

Steel web plates	9,000
Steel shop rivets and pins	10,000
Steel field rivets	8,000
Steel field bolts	7,000
Wrought iron web plates	6,000
Wrought iron shop rivets and pins	7,500
Wrought iron field rivets	6,000
Wrought iron field bolts	5,500
Cast iron	3,000

	With fiber.	Across fiber.
Yellow pine	70	500
White pine	40	250
Spruce	50	320
Oak	100	600
Locust	100	720
Hemlock	40	275
Chestnut	..	150

SAFE EXTREME FIBER STRESS (BENDING).

Rolled steel beams	16,000
Rolled steel pins, rivets and bolts	20,000
Riveted steel beams (net flange section)	14,000
Rolled wrought iron beams	12,000
Rolled wrought iron pins, rivets and bolts	15,000
Riveted wrought iron beams (net flange section)	12,000
Cast iron, compression side	16,000
Cast iron, tension side	3,000
Yellow pine	1,200
White pine	800
Spruce	800
Oak	1,000
Locust	1,200
Hemlock	600
Chestnut	800
Granite	180
Greenwich stone	150
Gneiss (New York City)	150
Limestone	150
Slate	400
Marble	120
Sandstone	100
Bluestone, North River	300
Concrete (Portland) cement, 1; sand, 2; stone, 4	30
Concrete (Portland) cement, 1; sand, 2; stone, 5	20
Concrete (Rosendale, or equal) cement, 1; sand, 2; stone, 4	16
Concrete (Rosendale, or equal) cement, 1; sand, 2; stone, 5	10
Brick (common)	50
Brickwork (in cement)	30

SECTION 17. Wind Pressure. — All structures exposed to wind shall be designed to resist a horizontal wind pressure of 30 pounds for every square foot of surface thus exposed, from the ground to the top of same, including roof, in any direction. In no case shall the overturning moment due to wind pressure exceed seventy-five per centum of the moment of stability of the structure. In all structures exposed to wind, if the resisting moments of the ordinary materials of construction, such as masonry, partitions, floors and connections, are not sufficient to resist the moment of distortion due to wind pressure, taken in any direction on any part of the structure, additional bracing shall be introduced sufficient to make up the difference in the moments. In calculations for wind bracing, the working stresses set forth in this law may be increased by fifty per centum.

In buildings under one hundred feet in height, provided the height does not exceed four times the average width of the base, the wind pressure may be disregarded.

ARTICLE V.

EXCAVATIONS AND FOUNDATIONS.

SECTION 1. Excavations. — All excavations for buildings shall be properly guarded and protected so as to prevent the same from becoming dangerous to life or limb, and shall be sheath-piled where necessary to prevent the adjoining earth from caving in, by the person or persons causing the excavations to be made. Plans filed in the building department shall be accompanied by a statement of the character of the soil at the level of the footings. When an excavation is made on any lot, the person or persons causing such excavation to be made shall build, at his or their own cost and expense, a retaining wall to support the adjoining earth; and such retaining wall shall be carried to the height of the adjoining earth, and be properly protected by coping. The thickness of a retaining wall at its base shall be in no case less than one-fourth of its height.

SECTION 2. Whenever an excavation of either earth or rock for building or other purposes shall be intended to be, or shall be carried to the depth of more than ten feet below the curb, the person or persons causing such excavation to be made shall at all times, from the commencement until the completion thereof, if afforded the necessary license to enter upon the adjoining land and not otherwise, at his or their own expense preserve any adjoining or contiguous wall or walls, structure or structures from injury, and support the same by proper foundations so that the said wall or walls, structure or structures, shall be and remain practically as safe as before such excavation was commenced, whether the said adjoining or contiguous wall or walls, structure or structures, are down more or less than ten feet below the curb. If the necessary license is not accorded to the person or persons making such excavation, then it shall be the duty of the owner refusing to grant such license to make the adjoining or contiguous wall or walls, structure or structures, safe, and support the same by proper foundations so that adjoining excavations may be made, and shall be permitted to enter upon the premises where such excavation is being made for that purpose, when necessary.
If such excavation shall not be intended to be, or shall not be, carried to a depth of more than ten feet below the curb, the owner or owners of such adjoining or contiguous wall or walls, structure or structures, shall preserve the same from injury, and so support the same by proper founda-

tions that it or they shall be and remain practically as safe as before such excavation was commenced, and shall be permitted to enter upon the premises where such excavation is being made for that purpose, when necessary.

In case an adjoining party wall is intended to be used by the person or persons causing the excavation to be made, and such party wall is in good condition and sufficient for the uses of the adjoining building, then and in such case the person or persons causing the excavations to be made shall, at his or their own expense, preserve such party wall from injury and support the same by proper foundations, so that said party wall shall be and remain practically as safe as before the excavation was commenced.

If the person or persons whose duty it shall be to preserve or protect any wall or walls, structure or structures, from injury shall neglect or fail so to do after having had a notice of twenty-four hours from the building department, then the commissioner may enter upon the premises and employ such labor, and furnish such materials, and take such steps as, in his judgment, may be necessary to make the same safe and secure, or to prevent the same from becoming unsafe or dangerous, at the expense of the person or persons whose duty it is to keep the same safe and secure. Any party doing the said work, or any part thereof, under and by direction of the said building department, may bring and maintain an action against the person or persons last herein referred to, to recover the value of the work done and materials furnished, in and about the said premises, in the same manner as if he had been employed to do the said work by the said person or persons.

SECTION 3. Bearing Capacity of Soil. — Where no test of the sustaining power of the soil is made, different soils, excluding mud, at the bottom of the footings, shall be deemed to safely sustain the following loads to the superficial foot, namely: Soft clay, one ton per square foot; ordinary clay and sand together, in layers, wet and springy, two tons per square foot; loam, clay or fine sand, firm and dry, three tons per square foot; very firm, coarse sand, stiff gravel or hard clay, four tons per square foot, or as otherwise determined by the commissioner. Where a test is made of the sustaining power of the soil the commissioner shall be notified so that he may be present in person or by representative. The record of the test shall be filed in the building department. When a doubt arises as to the safe sustaining power of the earth upon which a building is to be erected the building department may order borings to be made, or direct the sustaining power of the soil to be tested by and at the expense of the owner of the proposed building.

SECTION 4. Pressure Under Footings of Foundations. — The loads exerting pressure under the footings of foundations in buildings more than three stories in height are to be computed as follows: For warehouses and factories they are to be the full dead load and the full live load established by Sections 1 and 3 of Article VII. In stores and buildings for light manufacturing purposes they are to be the full dead load and seventy-five per cent. of the live load established by Sections 1 and 3 of Article VII.

In churches, schoolhouses, and places of public amusement or assembly, they are to be the full dead load and seventy-five per cent. of the live load established by Sections 1 and 3 of Article VII.

In office buildings, hotels, dwellings, apartment houses, tenement houses, lodging houses and stables they are to be the full dead load and sixty per cent. of the live load established by Sections 1 and 3 of Article VII.

Footings shall be so designed that the loads will be as nearly uniform as possible and not in excess of the safe bearing capacity of the soil, as established by Section 3, Article V.

SECTION 5. Foundations. — Every building, except buildings erected upon solid rock or buildings erected upon wharves and piers on the water-front shall have foundations of brick, stone, iron, steel or concrete laid not less than four feet below the surface of the earth, on the solid ground or level surface of rock, or upon piles or ranging timbers when solid earth or rock is not found. Piles intended to sustain a wall, pier or post shall be spaced not more than thirty-six or less than twenty inches on centres, and they shall be driven to a solid bearing if practicable to do so, and the number of such piles shall be sufficient to support the superstructure proposed. No pile shall be used of less dimensions than six inches at the small end and ten inches at the butt. No pile shall be weighted with a load exceeding forty thousand pounds. When a pile is not driven to refusal, its safe sustaining power shall be determined by the following formula: Twice the weight of the hammer in tons multiplied by the height of the fall in feet divided by least penetration of pile under the last blow in inches plus one. The commissioner shall be notified of the time when such test piles will be driven, that he may be present in person or by representative. The tops of all piles shall be cut off below the lowest water line. When required, concrete shall be rammed down in the interspaces between the heads of the piles to a depth and thickness of not less than twelve inches and for one foot in width outside of the piles. When ranging and capping timbers are laid on piles for foundations, they shall be of hard wood not less than six inches thick and properly joined together, and their tops laid below the lowest water line. Where metal is incorporated in or forms part of a foundation it shall be thoroughly protected from rust by paint, asphaltum, concrete, or by such materials and in such manner as may be approved by the commissioner. When footings of iron or steel for columns are placed below the water level, they shall be similarly coated, or inclosed in concrete, for preservation against rust. When foundations are carried down through earth by piers of stone, brick or concrete in caissons, the loads on same shall be not more than fifteen tons to the square foot when carried down to rock; ten tons to the square foot when carried down to firm gravel or hard clay; eight tons to the square foot in open caissons or sheet pile trenches when carried down to rock.

Every wooden building, hereafter erected on soft and marshy land, and used for a workshop or other like purpose, or as a temporary structure, may, if said commissioner approves, rest upon mud-sills or blocks, or on piles cut to the height of grade.

SECTION 6. Foundation Walls. — Foundation walls shall be construed to include all walls and piers built below the curb level, or nearest tier of beams to the curb, to serve as supports for walls, piers, columns, girders, posts or beams. Foundation walls shall be built of stone, brick, Portland cement concrete, iron or steel. Foundation walls of rubble stone shall not be used in buildings over forty feet in height except third-class buildings. Foundations of rubble shall be at least twenty-five per cent. thicker than is required for granite foundations. Foundations of block granite or of concrete shall be at least eight inches thicker than the wall next above them to a depth of twelve feet below the street grade; and for every additional ten feet or part thereof, deeper, they shall be increased four inches in thickness. If built of brick, they shall be at least four inches thicker than the wall next above them to a depth of twelve feet below the curb level; and for every additional ten feet, or part thereof, deeper, they shall be increased four inches in thickness. No foundation wall of rubble or concrete shall be less than eighteen inches thick.

The footing or base course shall be of stone or concrete, or both, or of concrete and stepped-up brickwork, of sufficient thickness and area to safely bear the weight to be imposed thereon. If the footing or base course be of concrete, the concrete shall not be less than twelve inches thick. If of stone, the stones shall not be less than two by three feet, and at least eight inches in thickness for walls; and not less than ten inches in thickness if under piers, columns or posts; the footing or base course, whether formed of concrete or stone, shall be at least twelve inches wider than the bottom width of walls, and at least twelve inches wider on all sides than the bottom width of said piers, columns or posts. If the superimposed load is such as to cause undue transverse strain on a footing projection twelve inches, the thickness of such footing is to be increased so as to carry the load with safety. For small structures and for small piers sustaining light loads, the commissioner may, in his descretion, allow a reduction in the thickness and projection for footing or base courses herein specified. All base stones shall be well bedded and laid crosswise, edge to edge.

If stepped-up footing of brick are used in place of stone above the concrete, the off-sets, if laid in single courses, shall each not exceed one and one-half inches, or if laid in double courses, then each shall not exceed three inches, offsetting the first course of brickwork, back one-half the thickness of the concrete base, so as to properly distribute the load to be imposed thereon.

If, in place of a continuous foundation wall, isolated piers are to be built to support the superstructure, where the nature of the ground and the character of the building make it necessary, in the opinion of the commissioner, inverted arches resting on a proper bed of concrete, both designed to transmit with safety the superimposed loads, shall be turned between the piers. The thrust of the outer piers shall be taken up by suitable wrought iron or steel rods and plates.

Grillage beams of wrought iron or steel resting on a proper concrete bed may be used. Such beams must be provided with separators and bolts inclosed and filled solid between with concrete and of such sizes and so arranged as to transmit with safety the superimposed loads.

All stone walls twenty-four inches or less in thickness shall have at least one header extending through the wall in every three feet in height from the bottom of the wall, and in every three feet in length, and if over twenty-four inches in thickness, shall have one header for every six superficial feet on both sides of the wall, laid on top of each other to bond together, and running into the wall at least two feet.

All headers shall be at least twelve inches in width and eight inches in thickness and consist of good flat stones.

No stone shall be laid in such walls in any other position than on its natural bed.

No stone shall be used that does not bond or extend into the wall at least six inches. Stones shall be firmly bedded in mortar and all spaces and joints thoroughly filled. No round or boulder stone shall be used.

ARTICLE VI.

WALLS, PIERS AND PARTITIONS.

SECTION 1. Materials of Walls. — The walls of all buildings, other than frame or wood buildings, shall be constructed of stone, brick, Portland cement concrete, iron, steel or other hard, incombustible material, and the several component parts of such buildings shall be as herein provided. All buildings shall be inclosed on all sides with independent or party walls.

SECTION 2. Walls and Piers. — In all walls of the thickness specified in this law, the same amount of materials may be used in piers or buttresses. Bearing walls shall be taken to mean those walls on which the beams, girders or trusses rest. If any horizontal section through any part of any bearing wall in any building shows more than thirty per centum area of flues and openings, the said wall shall be increased four inches in thickness for every fifteen per centum, or fraction thereof, of flue or opening area in excess of thirty per centum.

The walls and piers of all buildings shall be properly and solidly bonded together with close joints filled with mortar. They shall be built to a line and be carried up plumb and straight. The walls of each story shall be built up the full thickness to the top of the beams above. Bricks when laid shall be wet or dry, as the commissioner may direct. Walls or piers, or parts of walls and piers, shall not be built in freezing weather, and if frozen, shall not be built upon.

All piers shall be built of stone or good, hard, well-burnt brick laid in cement mortar. Every pier built of brick, supporting any beam, girder, arch or column on which a wall rests, or lintel spanning an opening over ten feet and supporting a wall, shall have a cap or a cast iron plate of sufficient strength, and the full size of the piers. Isolated brick piers shall not exceed in height ten times their least dimensions. Stone posts for the support of posts or columns above shall not be used in the interior of any building. Where walls or piers are built of coursed stones, with dressed level beds and vertical joints, the building department shall have the right to allow such walls or piers to be built of a less thickness than specified for brickwork, but in no case shall said walls or piers be less than three-quarters of the thickness provided for brickwork.

In all brick walls every eighth course at least shall be a heading course, except where walls are faced with brick in running bond, in which latter case, every eighth course shall be bonded into the backing by cutting the course of the face brick and putting in diagonal headers behind the same, or by splitting the face brick in half and backing the same with a continuous row of headers. Where face brick is used of a different thickness from the brick used for backing, the courses of the exterior and interior brickwork shall be brought to a level bed at intervals of not more than ten courses in height of the face brick, and the face brick shall be properly tied to the backing by a heading course of the face brick. All bearing walls faced with brick laid in running bond shall be four inches thicker than the walls are required to be under any section of this law.

SECTION 3. **Ashlar.** — Stone used for the facing of any building, and known as ashlar, shall be not less than four inches thick.

Stone ashlar shall be anchored to the backing and the backing shall be of such thickness as to make the walls, independent of the ashlar, conform as to the thickness with the requirements of Sections 5 and 6 of this Article, unless the ashlar be at least eight inches thick and bonded into the backing, and then it may be counted as part of the thickness of the wall.

Iron ashlar plates used in imitation of stone ashlar on the face of a wall shall be backed up with the same thickness of brickwork as stone ashlar.

SECTION 4. **Mortar for Walls and Ashlar.** — All isolated piers, parapet walls and chimneys above roofs shall be laid in cement mortar, but this shall not prohibit the use in cold weather of a small proportion of lime to prevent the mortar from freezing. Mortar for first-class building shall for one-half their height be no poorer than one part cement, two parts sand; above, equal parts of lime and cement and the proper proportion of sand. Mortar for second-class buildings, and for such parts of third-class buildings as are below the level of the sidewalk, shall be no poorer than equal parts of lime and cement, with a proper proportion of sand.

Mortar for third-class buildings above ground shall be no poorer than the best lime mortar. All other walls built of brick or stone shall be laid in lime, cement, or lime and cement mortar mixed.

The backing up of all stone ashlar shall be laid up with cement mortar, or cement and lime mortar mixed, but the back of the ashlar may be parged with lime mortar to prevent discoloration of the stone.

SECTION 5. **Walls for Dwelling-Houses.** — The expression "Walls for dwelling-houses" shall be taken to mean and include in this class walls for the following buildings:

Dwellings, asylums, apartment-houses, convents, club-houses, dormitories, hospitals, hotels, lodging-houses, tenements, parish buildings, laboratories, studios.

The walls above the foundation of dwelling-houses of the first or second class, hereafter built, not over twenty-three feet wide or thirty-three feet high, or fifty-five feet deep, external walls shall be not less than eight inches thick and party walls shall be not less than twelve inches thick. In case such buildings are to be used for store purposes the external walls thereof to the top of the second floor timbers shall be not less than twelve inches thick. All walls of dwellings hereafter erected or which may be altered to be used for dwellings and being over thirty-three feet in height and not over fifty feet in height, shall be not less than twelve inches thick above the foundation-wall. No wall shall be built having a twelve-inch thick portion measuring vertically more than fifty feet. If over fifty feet in height and not over sixty feet in height the wall shall be not less than sixteen inches thick in the story next above the foundation-walls and from thence not less than twelve inches to the top. If over sixty feet in height and not over seventy-five feet in height, the walls shall be not less than sixteen inches thick above the foundation-walls to the height of twenty-five feet, or to the nearest tier of beams to that height, and from thence not less than twelve inches thick to the top. If over seventy feet in height, and not over one hundred feet in height, the walls shall be not less than twenty inches thick above the foundation-walls to the height of forty feet, or to the nearest tier of beams to that height, thence not less than sixteen inches thick to the height of seventy-five feet, or to the nearest tier of beams to that height, and thence not less than twelve inches thick to the top. If over one hundred feet in height and not over one hundred and twenty-five feet in height, the walls shall be not less than twenty-four inches thick above the foundation-walls to the height of forty feet or to the nearest tier of beams to that height, thence not less than twenty inches thick to the height of seventy-five feet, or to the nearest tier of beams of that height, thence not less than sixteen inches thick to the height of one hundred and ten feet, or to the nearest tier of beams to that height, and thence not less than twelve inches thick to the top.

Section 6. Walls for Warehouses. — The expression "Walls for warehouses" shall be taken to mean and include in this class walls for the following buildings:

Warehouses, stores, factories, mills, printing-houses, pumping stations, refrigerating-houses, slaughter-houses, wheelwright shops, cooperage shops, breweries, light and power houses, sugar refineries, office buildings, stables, markets, railroad buildings, jails, police stations, schools, court-houses, observatories, foundries, machine shops, public assembly buildings, armories, churches, theatres, libraries, museums. The walls of all warehouses, twenty-five feet or less in width between walls or bearings, shall be not less than twelve inches thick to the height of forty feet above the foundation-walls. If over forty feet in height, and not over sixty feet in height, the walls shall be not less than sixteen inches thick above the foundation-walls to the height of forty feet, or to the nearest tier of beams to that height, and thence not less than twelve inches thick to the top. If over sixty feet in height, and not over seventy-five feet in height, the walls shall be not less than twenty inches thick above the foundation-walls to the height of twenty-five feet, or to the nearest tier of beams to that height, and thence not less than sixteen inches thick to the top. If over seventy-five feet in height, and not over one hundred feet in height the walls shall be not less than twenty-four inches thick above the foundation-walls to the height of forty feet, or to the nearest tier of beams to that height, thence not less than twenty inches thick to the height of seventy-five feet, or to the nearest tier of beams to that height, and thence not less than sixteen inches thick to the top.

If there is to be a clear span of over twenty-five feet between the bearing walls, such walls shall be four inches more in thickness than in this section specified, for every twelve and one-half feet, or fraction thereof, that said walls are more than twenty-five feet apart, or shall have instead of the increased thickness such piers or buttresses as, in the judgment of the commissioner, may be necessary.

The walls of buildings of a public character shall be not less than in this law specified for warehouses with such piers or such buttresses, or supplemental columns of iron or steel, as, in the judgment of the commissioner, may be necessary to make a safe and substantial building.

In all stores, warehouses or factories over twenty-five feet in width between walls there shall be brick partition-walls, or girders supported on iron, steel, or wood columns, or piers of masonry.

SECTION 7. One-story Brick Buildings. — One-story structures not exceeding a height of fifteen feet may be built with eight-inch walls when the bearing walls are not more than nineteen feet apart, and the length of the eight-inch bearing walls does not exceed fifty-five feet.

SECTION 8. Inclosure Walls for Skeleton Structures. — Walls of brick built in between iron or steel columns, and supported wholly or in part on iron or steel girders, shall be not less than twelve inches thick for seventy-five feet of the uppermost height thereof, or to the nearest tier of beams to that measurement, in any building so constructed, and every lower section of sixty feet, or to the nearest tier of beams to such vertical measurement, or part thereof, shall have a thickness of four inches more than is required for the section next above it down to the tier of beams nearest to the curb level; and thence downward, the thickness of walls shall increase in the ratio prescribed in Section 5, Article VI., this law.

SECTION 9. Curtain Walls. — Curtain walls built in between piers of iron or steel columns and not supported on steel or iron girders, shall be not less than twelve inches thick for sixty feet of the uppermost height thereof, or nearest tier of beams to that height, and increased four inches for every additional section of sixty feet or nearest tier of beams to that height.

SECTION 10. **Existing Party Walls.** — Walls heretofore built for or used as party walls, whose thickness at the time of their erection was in accordance with the requirements of the then existing laws, but which are not in accordance with the requirements of this law, may be used, if in good condition, for the ordinary uses of party walls, provided the height of the same be not increased.

SECTION 11. **Walls of Unfinished Buildings.** — Any building the erection of which was commenced in accordance with specifications and plans submitted to and approved by the building department prior to the passage of this law, if properly constructed, and in safe condition, may be completed, or built upon in accordance with the requirements of law, as to thickness of walls, in force at the time when such specifications and plans were approved.

SECTION 12. **Walls Tied, Anchored and Braced.** — In no case shall any wall or walls of any building be carried up more than two stories in advance of any other wall, except by permission of the commissioner, but this prohibition shall not include the enclosure walls for skeleton buildings. The front, rear, side and party walls shall be properly bonded together, or anchored to each other every six feet in their height by wrought iron tie anchors, not less than one and a half inches by three-eights of an inch in size, and not less than twenty-four inches in length. The side anchors shall be built into the side or party walls not less than sixteen inches, and into the front and rear walls, so as to secure the front and rear walls to the side, or party walls, when not built and bonded together. All exterior piers shall be anchored to the beams or girders on the level of each tier. The walls and beams of every building, during the erection or alteration thereof, shall be strongly braced from the beams of each story, and when required, shall also be braced from the outside, until the building is inclosed. The roof tier of wood beams shall be safely anchored, with plank or joist, to the beams of the story below until the building is inclosed.

SECTION 13. **Arches and Lintels.** — Openings for doors and windows in all buildings, shall have good and sufficient arches of stone, brick, or terra-cotta, well built and keyed with good and sufficient abutments, or lintels of stone, iron or steel of sufficient strength, which shall have a bearing at each end of not less than five inches on the wall. On the inside of all openings in which lintels shall be less than the thickness of the wall to be supported, there shall be timber lintels, which shall rest at each end not more than three inches on any wall, which shall be chamfered at each end, and shall have a suitable arch turned over the timber lintel, or the inside lintel may be of cast iron, or wrought iron or steel, and in such case stone blocks or cast iron plates shall not be required at the ends where the lintel rests on the walls, provided the opening is not more than six feet in width.

All masonry arches shall be capable of sustaining the weight and pressure which they are designed to carry, and the stress at any point shall not exceed the working stress for the material used, as given in Section 16, Article IV., of this law. Tie rods shall be used when necessary to secure stability.

SECTION 14. Parapet Walls. — All exterior and division or party walls over fifteen feet high, excepting where such walls are to be finished with cornices, gutters or crown mouldings, shall have parapet walls not less than eight inches in thickness and carried two feet above the roof, but for warehouses, factories, stores and other buildings used for commercial or manufacturing purposes the parapet walls shall be not less than twelve inches in thickness and carried three feet above the roof, and all such walls shall be coped with stone, terra-cotta or cast iron: provided, that in case of buildings not over forty-five feet in height the distance that any wall is carried above the roof boarding need not exceed twelve inches.

SECTION 15. Hollow Walls. — In all walls that are built hollow the same quantity of stone, brick or concrete shall be used in their construction as if they were built solid, as in this law provided, and no hollow wall shall be built unless the parts of same are connected by proper ties, either of brick, stone or iron, placed not over twenty-four inches apart.

SECTION 16. Hollow Bricks on Inside of Walls. — The inside four inches of all walls may be built of hard-burnt hollow brick, properly tied and bonded into the walls, and of the dimension of ordinary bricks. Where hollow tile or porous terra-cotta blocks are used as lining or furring for walls, they shall not be included in the measurement of the thickness of such walls.

SECTION 17. Recesses, Chase, and Flues in Walls. — Recesses for stairways or elevators may be left in the foundation or cellar walls of all buildings, but in no case shall the walls be of less thickness than the walls of the fourth story, unless reinforced by additional piers with iron or steel girders, or iron or steel columns and girders, securely anchored to walls on each side. Recesses for alcoves and similar purpose shall have not less than eight inches of brickwork at the back of such recesses, and such recesses shall be not more than eight feet in width, and shall be arched over or spanned with iron or steel lintels, and not carried up higher than eighteen inches below the bottom of the beams of the floor next above. No chase for water or other pipes shall be made in any pier, and in no wall more than one-third of its thickness. The chases around said pipe or pipes shall be filled up with solid masonry for the space of one foot at the top and bottom of each story. No horizontal recess, chase or flue in any wall shall be allowed exceeding four feet in length without permission of the commissioner. The aggregate area of recesses and chases in any wall shall not exceed one-fourth of the whole area of the face of the wall on any story, nor shall any such recess be made within a distance of six feet from any other recess in the same wall.

SECTION 18. Light and Vent Shafts. — In every building hereafter erected or altered, all the walls or partitions forming interior light or vent shafts, shall be built of brick, or such other fireproof materials as may be approved by the commissioner. The walls of all light or vent shafts, whether exterior or interior, hereafter erected, shall be carried up not less than three feet above the level of the roof, and the brick walls coped as other parapet walls. Vent shafts to light interior bathroom in private dwellings may be built of wood filled in solidly with brick or hard-burnt clay blocks, when extending through not more than one story in height, and carried not less than two feet above the roof, covered with a ventilating skylight of metal and glass.

SECTION 19. Brick and Hollow Tile Partitions. — Eight-inch brick and six-inch and four-inch hollow tile partitions, of hard-burnt clay, or porous terra-cotta, may be built, not exceeding in their vertical portions a measurement of fifty, thirty-six, and twenty-four feet respectively, and in their horizontal measurement a length not exceeding seventy-five feet, unless strengthened by proper cross-walls, piers, or buttresses, or built in iron or steel framework. All such partitions shall be carried on proper foundations, or on iron or steel girders, or on iron or steel girders and columns or piers of masonry.

ARTICLE VII.

FLOORS, WOOD BEAMS, GIRDERS AND COLUMNS.

SECTION 1. The dead loads in all buildings shall consist of the actual weight of walls, roofs, partitions and all permanent construction.

The live or variable loads shall consist of all loads other than dead loads.

Every floor shall be of sufficient strength to bear safely the weight to be imposed thereon in addition to the weight of the materials of which the floor is composed; if to be used as a dwelling-house, apartment-house, tenement-house, hotel or lodging house, each floor shall be of sufficient strength in all its parts to bear safely upon every superficial foot of its surface not less than fifty pounds; if to be used for office purposes, not less than seventy-five pounds upon every superficial foot above the first floor, and for the latter floor one hundred and fifty pounds; if to be used as a school or place of instruction, not less than seventy-five pounds upon every superficial foot; if to be used for stable and carriage-house purposes, not less than seventy-five pounds upon every superficial foot; if to be used as a place of public assembly, not less than ninety pounds upon every superficial foot; if to be used for ordinary stores, light manufacturing and light storage, not less than one hundred and twenty pounds upon every superficial foot; if to be used as a store where heavy materials are kept or stored, warehouse, factory or for any other manufacturing or commercial purpose, not less than one hundred and fifty pounds upon every superficial foot.

The strength of factory floors intended to carry running machinery shall be increased above the minimum given in this section in proportion to the degree of vibratory impulse liable to be transmitted to the floor, as may be required by the commissioner. The roofs of all buildings having a pitch of less then twenty degrees shall be proportioned to bear safely fifty pounds upon every superficial foot of their surface in addition to the weight of materials composing the same. If the pitch be more then twenty degrees the live load shall be assumed at thirty pounds upon every superficial foot measured on a horizontal plane. For sidewalks between the curb and area lines the live load shall be taken at three hundred pounds upon every superficial foot. Every column, post or other vertical support shall be of sufficient strength to bear safely the weight of the portion of each and every floor depending on it for support, in addition to the weight required as before stated to be supported safely upon said portions of said floors. For the purpose of determining the carrying capacity of columns in dwellings, office buildings, stores, stables and public buildings when over five stories in height, a reduction of the live loads shall be permissible as follows: For the roof and top floor the full live loads shall be used; for each succeeding lower floor it shall be permissible to reduce the live load by five per cent, until fifty per cent. of the live loads fixed by this section is reached, when such reduced loads shall be used for all remaining floors.

SECTION 2. Loads on Floors to be Distributed. — The weight placed on any of the floors of any building shall be safely distributed thereon. The commissioner may require the owner or occupant of any building or of any portion thereof to redistribute the load on any floor or to lighten such load, where he deems it to be necessary.

SECTION 3. Strength of Existing Floors to be Calculated. — In all warehouses, storehouses, factories, workshops and stores where heavy materials are kept or stored, or machinery introduced, the weight that each floor will safely sustain upon each superficial foot thereof, or upon each varying part of such floor, shall be estimated by the owner or occupant, or by a competent person employed by the owner or occupant. Such estimate shall be reduced to writing, on printed forms furnished by the Building Department, stating the material size, distance apart and span of beams and girders, posts or columns to support floors, and its correctness shall be sworn to by the person making the same, and it shall thereupon be filed in the office of the Building Department. But if the commissioner of buildings shall have cause to doubt the correctness of said estimate, he is empowered to revise and correct the same, and for the purpose of such revision the officers and employees of the Building Department may enter any building and remove so much of any floor or other portion thereof as may be required to make necessary measurements and examination. When the correct estimate of the weight that the floors in any such buildings will safely sustain has been ascertained, as herein provided, the building department shall approve the same, and thereupon the owner or occupant of said building, or of any portion thereof, shall post a copy of such approved estimate in a conspicuous place on each story, or varying parts of each story, of the building to which it relates. Before any building hereafter erected is occupied and used, in whole or in part, for any of the purposes aforesaid, and before any building, erected prior to the passage of this law, but not at such time occupied for any of the aforesaid purposes, is occupied or used, in whole or in part for any of said purposes, the weight that each floor will safely sustain upon each superficial foot thereof shall be ascertained and posted in a conspicuous place on each story or varying parts of each story of the building to which it relates. No person shall place, or cause or permit to be placed on any floor of any building any greater load than the safe load thereof, as correctly estimated and ascertained as herein provided. Any expense necessarily incurred in removing any floor or other portion of any building for the purpose of making any examination herein provided for shall be paid by the treasurer of the town of Brookline upon the requisition of the building commissioner. Such expenses shall be a charge against the person or persons by whom or on whose behalf said estimate was made, provided such examination proves the floors of insufficient strength to carry with safety the loads found upon them when such examination was made; and shall be collected in an action to be brought by the town against said person or persons, and the sum so collected shall be paid over to the said treasurer. When the architect of record for any building has filed with his application to build the data required to determine the strength of floors, on one of the blank forms provided for that purpose, such examination shall not be required provided that the purposes and uses of the building have not been changed.

SECTION 4. Strength of Temporary Supports. — Every temporary support placed under any structure, wall, girder, or beam, during the erection, finishing, alteration or repairing of any building or structure or any part thereof, shall be of sufficient strength to safely carry the load to be placed thereon.

SECTION 5. Fireproof Floors. — Fireproof floors shall be constructed with wrought iron or steel floor beams so arranged as to spacing and length of beams that the load to be supported by them, together with the weights of the materials used in the construction of the said floors shall not cause a greater deflection of the said beams than one-thirtieth of an inch per foot of span under the total load; and they shall be tied together at intervals of not more than eight times the depth of the beam. Between the wrought iron or steel floor beams shall be placed brick arches springing from the lower flange of the steel beams. Said brick arches shall be designed with a rise to safely carry the imposed load, but never less than one and one-quarter inches for each foot of span between the beams, and they shall have a thickness of not less than four inches for spans of five feet or less and eight inches for spans over five feet, or such thickness as may be required by the Building Department. Said brick arches shall be composed of good hard brick or hollow brick of ordinary dimensions laid to a line on the centres, properly and solidly bonded, each longitudinal line of brick breaking joints with the adjoining lines in the same ring and with the ring under it when more than a four-inch arch is used. The brick shall be well wet and the joints filled in solid with cement mortar. The arches shall be well grouted and properly keyed, or the space between the beams may be filled in with hollow tile arches of hard-burnt clay or porous terra-cotta of uniform density and hardness of burn. The skew backs shall be of such form and section as to properly receive the thrust of said arch, and the said arches shall be of a depth and sectional area to carry the load to be imposed thereon, without straining the material beyond its safe working load, but said depth shall not be less than one and three-quarters inches for each foot of span, not including any portion of the depth of the tile projecting below the underside of the beams, a variable distance being allowed of not over six inches in the span between the beams, if the soffits of the tile are straight; but if said arches are segmental, having a rise of not less than one and one-quarter inches for each foot of span, the depth of the tile shall be not less than six inches. The joints shall be solidly filled with cement mortar as required for common brick arches, and the arch so constructed that the key block shall always fall in the central portion. The shells and web of all end construction blocks shall abut, one against another, or the space between the beams may be filled with arches of Portland cement concrete, segmental in form, and which shall have a rise of not less than one and one-quarter inches for each foot of span between the beams. The concrete shall be not less than four inches in thickness at the crown of the arch and shall be mixed in the proportions required by Section 7 of Article IV. These arches shall in all cases be reinforced and protected on the underside with corrugated or sheet steel, steel ribs, or metal in other forms weighing not less than one pound per square foot, and having no openings larger than three inches square. Or between the said beams may be placed solid or hollow burnt clay, stone, brick, or concrete slabs in flat or curved shapes, concrete or other fireproof composition, and any of said materials may be used in combination with wire cloth, expanded metal, wire strands, or wrought iron or steel bars; but in any such construction and as a precedent condition to the same being used, tests shall be made as herein provided by the manufacturer thereof under the direction and to the satisfaction of the Building Department, and evidence of the same shall be kept on file in the Building Department, showing the nature of the test and the result of the test. Such tests shall be made by constructing within inclosure walls a platform consisting of four rolled steel beams, ten inches deep, weighing each twenty-five pounds per linear foot, and placed four feet between the centres, and connected by transverse tie-rods, and with a clear span of fourteen feet for the two interior beams and with the two outer beams supported on the side walls throughout their length, and with both a filling between the said beams, and a fireproof protection of the exposed parts of the beams of the system to be tested, constructed as in actual practice, with the quality of material ordinarily used in that system and the ceiling plastered below, as in a finished job, such filling between the two interior beams being loaded with a distributed load of one hundred and fifty pounds per square foot of its area and all carried by such filling; and subjecting the platform so constructed to the continuous heat of a wood fire below, averaging not less than seventeen hundred degrees Fahrenheit for not less than four hours, during which time the platform shall have remained in such condition that no flame will have passed through the platform or any part of the same, and that no part of the load shall have fallen through, and that the beams shall have been protected from the heat to the extent that after applying to the under side of the platform at the end of the heat test a stream of water directed against the bottom of the platform and discharged through a one and one-eighth inch nozzle under sixty pounds pressure for five minutes, and after flooding the top of the platform with water under low pressure, and then again applying the stream of water through the nozzle under the sixty pounds pressure to the bottom of the platform for five minutes, and after a total load of six hundred pounds per square foot uniformly distributed over the middle bay shall have been applied and removed, after the platform shall have cooled, the maximum deflection of the interior beams shall not exceed two and one-half inches. The Building Department may from time to time prescribe additional or different tests than the foregoing for systems of filling between iron or steel floor beams, and the protection of the exposed parts of the beams. Any system failing to meet the requirements of the test of heat, water and weight as herein prescribed shall be prohibited from use in any building hereafter erected. Duly authenticated records of the tests heretofore made of any system of fireproof floor filling and protection of the exposed parts of the beams may be presented to the Building Department, and if the same be satisfactory to said department, it shall be accepted as conclusive. No filling of any kind which may be injured by frost shall be placed between said floor beams during freezing weather, and if the same is so placed during any winter month, it shall be temporarily covered with suitable material for protection from being frozen. On top of any arch, lintel or other device which does not extend to and form a horizontal line with the top of the said floor beams, cinder concrete or other suitable fireproof material shall be placed to solidly fill up the space to a level with the top of the said floor beams, and shall be carried to the under side of the wood floor boards in case such be used. Temporary centerings when used in placing fireproof systems between floor beams, shall not be removed within twenty-four hours or until such time as the mortar or material has set. All fireproof floor systems shall be of sufficient strength to safely carry the load to be imposed thereon without straining the material in any case beyond its safe working load. The bottom flanges of all wrought iron or rolled steel floor and flat roof beams, and all exposed portions of such beams below the abutments of the floor arches shall be entirely incased with hard-burnt clay, porous terra-cotta or other fireproof material allowed to be used for the filling between the beams under the provisions of this section, such incasing material to be properly secured to the beams.

The exposed sides and bottom plates or flanges or wrought iron or rolled steel girders supporting iron or steel floor beams, or supporting floor arches or floors, shall be entirely incased in the same manner. Openings through fireproof floors for pipes, conduits and similar purposes shall be shown on the plans. After the floors are constructed no opening greater than eight inches square shall be cut through said floors unless properly boxed or framed around with iron. And such openings shall be filled in with fireproof material after the pipes or conduits are in place.

SECTION 6. Incasing Interior Columns. — All cast iron, wrought iron or rolled steel columns, including the lugs and brackets on same, used in the interior of any fireproof building, or used to support any fireproof floor, shall be protected with not less than two inches of fireproof material, securely applied. The extreme outer edge of lugs, brackets and similar supporting metal may project to within seven-eighths of an inch of the surface of the fireproofing.

SECTION 7. Wood Beams. — All wood beams and other timbers in the party wall of every building built of stone, brick or iron, shall be separated from the beam or timber entering in the opposite side of the wall by at least four inches of solid mason work. No wood floor beams or wood roof beams used in any building, hereafter erected, shall be of a less thickness than two inches. All wood trimmer and header beams shall be proportioned to carry with safety the loads they are intended to sustain. Every wood header or trimmer more than four feet long, used in any building, shall be hung in stirrup-irons of suitable thickness for the size of the timbers. Every wood beam, except header and tail beams, shall rest at one end four inches in the wall, or upon a girder as authorized by this law. The ends of all wood floor and roof beams, where they rest on brick walls, shall be cut to a bevel of three inches on their depth. In no case shall either end of a floor or roof beam be supported on stud partitions, except in frame buildings. All wood floor and wood roof beams shall be properly bridged with cross bridgings, and the distance between bridging or between bridging and walls shall not exceed eight feet. All wood beams shall be trimmed away from all flues and chimneys, whether the same be a smoke, air or any other flue or chimney. The trimmer beam shall be not less than eight inches from the inside face of a flue and four inches from the outside of a chimney breast, and the header beam not less than two inches from the outside face of the brick or stonework of the same; except that for the smoke flues of boilers and furnaces where the brickwork is required to be eight inches in thickness, the trimmer beam shall be not less than twelve inches from the inside of the flue. The header beam, carrying the tail beams of a floor, and supporting the trimmer arch in front of a fireplace, shall be not less than twenty inches from the chimney breast. The safe carrying capacity of wood beams for uniformily distributed loads shall be determined by multiplying the area in square inches by its depth in inches and dividing this product by the span of the beam in feet. This result is to be multiplied by seventy for hemlock, ninety for spruce and white pine, one hundred and twenty for oak, and by one hundred and forty for yellow pine. The safe carrying capacity of short span timber beams shall be determined by their resistance to shear in accordance with the unit stresses fixed by Section 16, Article IV., of this law.

SECTION 8. Anchors and Straps for Wood Beams and Girders. — Each tier of beams shall be anchored to the side, front, rear or party walls at intervals of not more than six feet apart, with good, strong, wrought iron anchors of not less than one and a half inches by three-eighths of an inch in size, well-fastened to the side of the beams by two or more nails made of wrought iron at least one-fourth by an inch in diameter. Where the beams are supported by girders, the girders shall be anchored to the walls and fastened to each other by suitable iron straps. The ends of wood beams resting upon girders shall be butted together end to end and strapped by wrought iron straps of the same size and distance apart, and in the same beam as the wall anchors, and shall be fastened in the same manner as said wall anchors. Or they may lap each other at least twelve inches and be well spiked or bolted together where lapped.

Each tier of beams front and rear, opposite each pier, shall have hard wood anchor strips dovetailed into the beams diagonally, which strips shall cover at least four beams and be one inch thick and four inches wide, but no such anchor strips shall be let in within four feet of the centre line of the beams; or wood strips may be nailed on the top of the beams and kept in place until the floors are being laid. Every pier and wall, front or rear, shall be well anchored to the beams of each story, with the same size anchors as are required for side walls, which anchors shall hook over the fourth beam.

SECTION 9. Wood Columns and Plates. — All timber columns shall be square at the end perpendicular to their axes.

To prevent the unit stresses from exceeding those fixed in this law, timber or iron cap and base plates shall be provided.

Additional iron cheek plates shall be placed between the cap and base plates and bolted to the girders when required to transmit the loads with safety.

SECTION 10. Timber for Trusses. — When compression members of trusses are of timber they shall be strained in the direction of the fibre only. When timber is strained in tension, it shall be strained in the direction of the fibre only. The working stress in timber struts of pin-connected trusses shall not exceed seventy-five per cent. of the working stresses established in Section 16 of Article IV.

SECTION 11. Bolts and Washers for Timber Work. — All bolts used in connection with timber and wood beam work shall be provided with washers of such proportions as will reduce the compression on the wood at the face of the washer to that allowed in Section 16 of Article IV., supposing the bolt to be strained to its limit.

ARTICLE VIII.

ROOFS, CORNICES, BULKHEADS, SCUTTLES, TANKS, LEADERS, SKYLIGHTS AND FLOORLIGHTS.

SECTION 1. **Mansard Roofs.** — If a Mansard or other roof of like character having a pitch of over sixty degrees be placed on any building, except a wood building, or a dwelling-house not exceeding three stories nor more than forty feet in height, it shall be constructed of iron rafters and lathed with iron or steel on the inside and plastered, or filled in with fireproof material not less than three inches thick, and covered with metal, slate or tile.

SECTION 2. **Cornices and Gutters.** — On all buildings of the first or second-class hereafter erected, the exterior cornices, inclusive of those on show-windows, and gutters shall be of some fireproof material, when so ordered by the building commissioner. All fireproof cornices shall be well secured to the walls with iron anchors, independent of any woodwork. In all cases the walls shall be carried up to the planking of the roof. Where the cornice projects above the roof the walls shall be carried up to top of the cornice. The party walls shall in all cases extend up above the planking of the cornice and be coped. All exterior wooden cornices that may now be or that may hereafter become unsafe or rotten, on buildings of the first or second-class, shall be taken down, and if replaced, shall be constructed of some fireproof material. All exterior cornices of wood or gutters on said buildings that may hereafter be damaged by fire to the extent of one-half shall be taken down, and if replaced shall be constructed of some fireproof materials, when so ordered by the building commissioner; but if not damaged to the extent of one-half, the same may be repaired with the same kind of material of which they were originally constructed.

SECTION 3. **Bulkheads on Roofs and Scuttles.** — Bulkheads used as inclosures for tanks and elevators, and coverings for the machinery of elevators and all other bulkheads, on buildings of the first or second class, hereafter erected or altered, may be constructed of hollow fireproof blocks; or of wood, covered with not less than two inches of fireproof material, or filled in the thickness of the studding with such material, and covered on all outside surfaces with metal, including both surfaces and edges of doors. All such buildings shall have scuttles or bulkheads covered with some fireproof materials, with ladders or stairs leading thereto, and easily accessible to all occupants. No scuttle shall be less in size than two by three feet. No staging or stand shall be constructed or occupied upon the roof of any building without first obtaining the written approval of the commissioner.

SECTION 4. Tanks. — Tanks containing more than five hundred gallons of water, or other fluid hereafter placed in any story, or on the roof or above the roof of any building now or hereafter erected, shall be supported on iron or steel beams of sufficient strength to safely carry the same; and the beams shall rest at both their ends on brick walls or on iron or steel girders or iron or steel columns or piers of masonry. Underneath any said water tank or on the side near the bottom of the same, there shall be a short pipe or outlet not less than four inches in diameter, fitted with a suitable valve having a lever or wheel handle to same, so that firemen or others can readily discharge the weight of the fluid contents from the tank, in case of necessity. Such tanks shall be placed where practicable at one corner of a building, and shall not be placed over nor near a line of stairs. Covers on top of water tanks placed on roofs, if of wood, shall be covered with tin.

SECTION 5. Roofing and Leaders. — The planking and sheathing of the roofs of buildings shall not in any case be extended across the side or party wall thereof. Every building of the first and second class (other than private dwellings), and the tops and sides of every dormer window thereon shall be covered and roofed with brick, tile, slate, tin, copper, iron, or plastic slate, asphalt, slag, or gravel may be used, provided such roofing shall be composed of not less than five layers of roofing felt, cemented together and finished with not less than ten gallons of coal tar, pitch or asphalt to each one hundred square feet of roof, or such other quality of fireproof roofing as the Building Department, under its certificate, may authorize, and the outside of the frames of every dormer window hereafter placed upon any building shall be made of some fireproof material. Nothing in this section shall be construed to prohibit the repairing of any shingle roof, provided the building is not altered in height. All buildings shall be kept provided with proper metallic leaders for conducting water from the roofs in such manner as shall protect the walls and foundations of said buildings from injury. In no case shall the water from the said leaders be allowed to flow upon the sidewalk.

SECTION 6. Metal Skylights. — All skylights having a superficial area of more than nine square feet, placed in any building, shall have sashes and frames constructed of iron and glass. Every fireproof roof hereafter placed on any building, shall have, besides the usual scuttle or bulkhead, a skylight or skylights of a superficial area equal to not less than one-fiftieth the superficial area of such fireproof roof. Skylights hereafter placed in public buildings, over any passageway or room of public resort, shall have immediately underneath the glass thereof a wire netting, unless the glass contains a wire netting within itself.

SECTION 7. Floor Lights. — Floor lights, used for transmission of light to floors below, shall be constructed of metal frames and bars or plates, and if any glass in same measures more than sixteen square inches, the glass shall be provided with a mesh of wire either in the glass or under the same, and the floor lights shall be of the same proportional strength as the floors in which they are placed.

ARTICLE IX.

CHIMNEYS AND FIREPLACES.

SECTION 1. All chimneys shall be built of brick, stone or other incombustible material.

SECTION 2. Trimmer Arches. — All fireplaces and chimney breasts where mantels are placed, whether intended for ordinary fireplace uses or not, shall have trimmer arches to support hearths, and the said arches shall be at least twenty inches in width, measured from the face of the chimney breast, and they shall be constructed of brick, stone or burnt clay. The length of a trimmer arch shall be not less than the width of the chimney breast. Wood centres under trimmer arches shall be removed before plastering the ceiling underneath. If a heater is placed in a fireplace, then the hearth shall be the full width of the heater. All fireplaces in which heaters are placed shall have incombustible mantels. No wood mantel or other woodwork shall be exposed back of a summer piece. The iron work of the summer piece shall be placed against the brick or stonework of the fireplace. No fireplace shall be closed with a wood fireboard.

SECTION 3. Chimneys, Flues and Fireplaces. — In all buildings hereafter erected every smoke-flue, if walls are less than eight inches thick, shall be lined on the inside with cast iron or well-burnt clay, or terra-cotta pipe, made smooth on the inside, from the bottom of the flue, or from the throat of the fireplace, if the flue starts from the latter, and carried up continuously to the extreme height of the flue. The ends of all such lining-pipes shall be made to fit close together, and the pipe shall be built in as the flue or flues are carried up. The walls shall be at least four inches thick, and plastered with mortar on the outside from bottom to roof boarding. No parging mortar shall be used on the inside of any fireplace, chimney or flue. The firebacks of all fireplaces hereafter erected shall be not less than eight inches in thickness, of solid masonry. When a grate is set in a fireplace, a lining of fire brick, at least two inches in thickness, shall be added to the fireback, unless soapstone, tile or cast iron is used and filled solidly behind with fireproof material. The stone or brickwork of the smoke flues of all boilers, furnaces, bakers' ovens, large cooking ranges, large laundry stoves, and all flues used for a similar purpose shall be capped with terra-cotta, stone or cast iron, if ordered by the commissioner.

On dwelling-houses and stables, three stories or less in height, not less than six of the top courses of a chimney may be laid in pure cement mortar and the brickwork carefully bonded and anchored together in lieu of said capping.

The inside four inches of all boiler flues, when ordered by the Building Department, shall be firebricks, laid in fire mortar, for a distance of twenty-five feet in any direction from the source of heat. All smoke flues of smelting furnaces or of extra large steam boilers, or other apparatus which heat the flues to a high temperature, shall be built with double walls of suitable thickness for the temperature with an air space between the walls, the inside four inches of the flues to be of fire brick. All smoke flues shall extend at least three feet above a flat roof, and at least two feet above a peak roof.

All flues in every building shall be properly cleaned and all rubbish removed, and the flues left smooth on the inside upon the completion of the building.

SECTION 4. Chimney Supports. — No chimney shall be supported by, started or built upon any floor or beam of wood.

In no case shall a chimney be corbelled out more than two-thirds the thickness of a wall, and in all such cases the corbelling shall consist of at least five courses of brick, but no corbelling shall be allowed in eight-inch brick walls. Where chimneys are supported by piers, the piers shall start from the foundation on the same line with the chimney breast, and shall be not less than twelve inches on the face, properly bonded into the walls. When a chimney is to be cut off below, in whole or in part, it shall be wholly supported by stone, brick, iron or steel. All chimneys which shall be dangerous in any manner whatever, shall be repaired and made safe, or taken down.

SECTION 5. Chimney of Cupolas. — Iron cupola chimneys of foundries shall extend at least ten feet above the highest point of any roof within a radius of fifty feet of such cupola, and be covered on top with a heavy wire netting. No woodwork shall be placed within two feet of the cupola.

ARTICLE X.

HEATING APPARATUS, DRYING ROOMS AND WATER PIPES.

SECTION 1. Heating Furnaces and Boilers. — A brick-set boiler shall not be placed on any wood or combustible floor or beams. Wood or combustible floors and beams under and not less than three feet in front and one foot on the sides of all portable boilers shall be protected by a suitable brick foundation of not less than two courses of brick well laid in mortar on sheet iron; the said sheet iron shall extend at least twenty-four inches outside of the foundation at the sides and front. Bearing lines of bricks, laid on the flat, with air spaces between them, shall be placed on the foundation to support a cast iron ash-pan of suitable thickness, on which the base of the boiler shall be placed and shall have a flange, turned up in the front and on the sides, four inches high; said pan shall be in width not less than the base of the boiler, and shall extend at least two feet in front of it. If a boiler is supported on a cast iron base with a bottom of the required thickness for an ashpan, and is placed on bearing lines of brick in the same manner as specified for an ash-pan, then an ash-pan shall be placed in front of the said base and shall not be required to extend under it. All lath and plaster and wood ceilings and beams over and to a distance of not less than four feet in front of all boilers shall be shielded with metal. The distance from the top of the boiler to said shield shall be not less than twelve inches. No combustible partition shall be within four feet of the sides and back and six feet from the front of any boiler, unless said partition shall be covered with metal to the height of at least three feet above the floor, and shall extend from the end or back of the boiler to at least five feet in front of it; then the distance shall be not less than two feet from the sides and five feet from the front of the boiler. All brick hot-air furnaces shall have two covers, with an air space of at least four inches between them; the inner cover of the hot-air chamber shall be either a brick arch or two courses of brick laid on galvanized iron or tin, supported on iron bars; the outside cover, which is the top of the furnace, shall be made of brick or metal supported on iron bars, and so constructed as to be perfectly tight, and shall be not less than four inches below any combustible ceiling or floor beams. The walls of the furnace shall be built hollow in the following manner:

One inner and one outer wall, each four inches in thickness, properly bonded together with an air space of not less than three inches between them. Furnaces must be built at least four inches from all woodwork. The cold-air boxes of all hot-air furnaces shall be made of metal, brick or other incombustible material, for a distance of at least five feet from the furnace. All portable hot-air furnaces shall be placed at least two feet from any wood or combustible partition or ceiling, unless the partitions and ceilings are properly protected by a metal shield, when the distance shall be not less than one foot. Wood floors under all portable furnaces shall be protected by two courses of brickwork well laid in mortar on sheet iron. Said brickwork shall extend at least two feet beyond the furnace in front of the ash-pan.

SECTION 2. Registers. — Registers located over a brick furnace shall be supported by a brick shaft built up from the cover of the hot-air chamber; said shaft shall be lined with a metal pipe, and all wood beams shall be trimmed away not less than four inches from it. Where a register is placed on any woodwork in connection with a metal pipe or duct, the end of the said pipe or duct shall be flanged over on the woodwork under it. All registers for hot-air furnaces placed in any woodwork or combustible floors shall have stone or iron borders firmly set in plaster of paris or gauged mortar. All register boxes shall be made of tin plate or galvanized iron with a flange on the top to fit the groove in the frame, the register to rest upon the same; there shall be an open space of two inches on all sides of the register box, extending from the under side of the border to and through the ceiling below. The said opening shall be fitted with a tight tin or galvanized iron casing, the uper end of which shall be turned under the frame. When a register box is placed in the floor over a portable furnace, the open space on all sides of the register box shall be not less than three inches. When only one register is connected with a furnace, said register shall have no valve.

SECTION 3. Drying-Rooms. — All walls, ceilings and partitions inclosing drying-rooms, when not made of fireproof material, shall be wire-lathed and plastered, or covered with metal, tile or other hard incombustible material.

SECTION 4. Ranges and Stoves. — Where a kitchen range is placed from twelve to six inches from a wood stud partition, the said partition shall be shielded with metal from the floor to the height of not less than three feet higher than the range; if the range is within six inches of the partition, then the studs shall be cut away and framed three feet higher and one foot wider than the range, and filled in to the face of the said stud partition with brick or fireproof blocks, and plastered thereon. All ranges on wood or combustible floors and beams that are not supported on legs and have ash-pans three inches or more above their base, shall be set on suitable brick foundations, consisting of not less than two courses of brick well laid in mortar on sheet iron, except small ranges such as are used in apartment-houses that have ash-pans three inches or more above their base, which shall be placed on at least one course of brickwork on sheet iron or cement. No range shall be placed against a furred wall. All lath and plaster or wood ceilings over all large ranges and ranges in hotels and restaurants shall be guarded by metal hoods placed at least nine inches below the ceiling. A ventilating pipe connected with a hood over a range shall be at least nine inches from all lath and plaster of woodwork, and shielded. If the pipe is less than nine inches from lath and plaster and woodwork, then the pipe shall be covered with one inch of asbestos plaster on wire mesh. No ventilating pipe connected with a hood over a range shall pass through any floor. Laundry stoves on wood or combustible floors shall have a course of bricks, laid on metal, on the floor under and extended twenty-four inches on all sides of them. All stoves for heating purposes shall be properly supported on iron legs resting on the floor three feet from all lath and plaster or woodwork; if the lath and plaster or woodwork is properly protected by a metal shield, then the distance shall be not less than eighteen inches. A metal shield shall be placed under and twelve inches in front of the ash-pan of all stoves that are placed on wood floors. All low gas stoves shall be placed on iron stands, or the burners shall be at least six inches above the base of the stoves, and metal guard plates placed four inches below the burners, and all woodwork under them shall be covered with metal.

SECTION 5. Notice as to Heating Apparatus. — In cases where hot water, steam, hot air or other heating appliances or furnaces are hereafter placed in any building, or flues or fireplaces are changed or enlarged, due notice shall first be given to the Building Department by the person or persons placing the said furnace or furnaces in said building, or by the contractor or superintendent of said work.

SECTION 6. Water Pipes. — No water or other pipes which may be introduced into any building shall be let into the beams unless the same be placed within thirty-six inches of the end of the beams; and in no building shall the said pipes be let into the beams more than two inches in depth. All said pipes shall be installed in accordance with the rules and regulations prescribed by the Building Department.

ARTICLE XI.

HEATING PIPES.

SECTION 1. Hot Air Flues, Pipes and Vent Ducts. — All stone or brick hot air flues and shafts shall be lined with tin, galvanized iron or burnt clay pipes. No wood casing, furring or lath shall be placed against or cover any smoke flue or metal pipe used to convey hot air or steam. No smoke pipe shall pass through any wood floor. No stovepipe shall be placed nearer than nine inches to any lath and plaster or board partition, ceiling or any woodwork. Smoke pipes of laundry stoves, large cooking ranges and of furnaces shall be not less than eighteen inches from any woodwork, unless they are properly guarded by metal shields; if so guarded, stovepipes shall be not less than six inches distant. Where smoke pipes pass through a lath and plaster partition they shall be guarded by galvanized iron ventilated thimbles at least twelve inches larger in diameter than the pipes, or by galvanized iron thimbles built in at least eight inches of brickwork. No smoke pipe shall pass through the roof of any building unless a special permit be first obtained from the building department for the same. If a permit is so granted, then the roof through which the smoke pipe passes shall be protected in the following manner: A galvanized iron ventilated thimble of the following dimensions shall be placed; in case of a stovepipe the diameter of the outside guard shall be not less than twelve inches and the diameter of the inner one, eight inches, and for all furnaces, or where similar large hot fires are used, the diameter of the outside guard shall be not less than eighteen inches and the diameter of the inner one, twelve inches. The smoke pipe thimbles shall extend from the under side of the ceiling or roof beams to at least nine inches above the roof, and they shall have openings for ventilation at the lower end where the smoke pipes enter, also at the top of the guards above the roof. Where a smoke pipe of a boiler passes through a roof, the same shall be guarded by a ventilated thimble, same as before specified, thirty-six inches larger than the diameter of the smoke pipe of the boiler. Tin or other metal pipes in brick or stone walls, used or intended to be used to convey heated air, shall be covered with brick or stone at least four inches in thickness. Woodwork near hot-air pipes shall be guarded in the following manner: If a hot-air pipe is nearer than two inches to any woodwork, said woodwork shall be entirely covered by a metal shield, but in no case must pipe be nearer than seven-eighths of an inch from the wood. The commissioner may demand further protection if he thinks it necessary. This shall not prevent the placing of metal lath and plaster directly on the face of hot-air pipes or the placing of woodwork on such metal lath or plaster, provided, the distance is not less than seven-eighths of an inch. No vertical hot-air pipe shall be placed in a stud partition, or in a wood inclosure, unless it be at least eight feet distant in a horizontal direction from the furnace. Hot-air pipes in closets shall be double, with a space of one inch between them. Horizontal hot-air pipes shall be placed six inches below the floor beams or ceiling; if the floor beams or ceiling are plastered and protected by a metal shield, then the distance shall be not less than three inches.

Vent flues or ducts for the removal of foul or vitiated air in which the temperature of the air cannot exceed that of the rooms, may be constructed of iron, or other incombustible material, and shall not be placed nearer than one inch to any woodwork, and no such pipe shall be used for any other purpose.

In the support or construction of such ducts, if placed in a public schoolroom, no wood furring or other inflammable material shall be nearer than two inches to said flues or ducts, and shall be covered on all sides other than those resting against brick, terra-cotta, or other incombustible material, with metal lath plastered with at least two heavy coats of mortar, and having at least one-half inch air space between the flues or ducts and the lath and plaster.

SECTION 2. Steam and Hot Water Heating Pipes. — Steam or hot water heating pipes shall not be placed within two inches of any timber or woodwork, unless the timber or woodwork is protected by a metal shield; then the distance shall be not less than one inch. All steam or hot water heating pipes passing through floors and ceilings or lath and plastered partitions shall be protected by a metal tube one inch larger in diameter than the pipe, having a metal cap at the floor, and where they are run in a horizontal direction between a floor and ceiling, a metal shield shall be placed on the under side of the floor over them, and on the sides of wood beams running parallel with said pipe.

All wood boxes or casings inclosing steam or hot water heating pipes and all wood covers to recesses in walls in which steam or hot water heating pipes are placed, shall be lined with metal. All pipes or ducts used to convey air warmed by steam or hot water shall be of metal or other fireproof material. All steam and hot water pipe coverings shall consist of fireproof materials only.

SECTION 3. Ducts for Pipes. — All ducts for pipes, wires, and other similar purposes shall be inclosed on all sides with fireproof material, and the opening through each floor shall be properly fire-stopped.

ARTICLE XII.

ELEVATORS, HOISTWAYS AND DUMB-WAITERS.

SECTION 1. Elevators and Hoistways. — In any building in which there shall be any hoistway or freight elevator or wellhole not inclosed in walls constructed of brick or other fireproof material and provided with fireproof doors, the openings thereof through and upon each floor of said building, shall be provided with and protected by a substantial guard or gate and with such good and sufficient trap-doors as may be directed and approved by the Building Department; and when in the opinion of the commissioner automatic trap-doors are required to the floor openings of any uninclosed freight elevator, the same shall be constructed so as to form a substantial floor surface when closed, and so arranged as to open and close by the action of the elevator in its passage either ascending or descending. The said commissioner shall have exclusive power and authority to require the openings of hoistways or hoistway shafts, elevators and wellholes in buildings to be inclosed or secured by trap-doors, guards or gates and railings. Such guards or gates shall be kept closed at all times, except when in actual use, and the trap-doors shall be closed at the close of the business of each day by the occupant or occupants of the building having the use or control of the same.

SECTION 2. Elevator Inclosures. — All elevators hereafter placed in any building, except such fireproof buildings as have been or may be hereafter erected, shall be inclosed in suitable walls of brick, or with a suitable framework of iron and burnt clay filling, or of such other fireproof material and form of construction as may be approved by the Building Department, except that the inclosure walls in non-fireproof buildings used as warehouses, stores or factories shall be of brick. If the inclosure walls are of brick, laid in cement mortar, and not used as bearing walls, they may be eight inches in thickness for not more than fifty feet of their uppermost height, and increasing in thickness four inches for each lower fifty feet portion or part thereof. Said walls or construction shall extend through and at least three feet above the roof. All openings in the said walls shall be provided with fireproof shutters or fireproof doors, made solid for three feet above the floor level, except that the doors used for openings in buildings intended for the occupancy of one family may be of wood covered on the inner surface and edges with metal, not including the openings in the cellar, nor above the roof in any such shaft walls. The roofs over all inclosed elevators shall be made of fireproof materials, with a skylight at least three-fourths the area of the shaft, made of glass, set in iron frames. When the shaft does not extend to the ground, the lower end shall be inclosed in fireproof material.

SECTION 3. Dumb-waiter Shafts. — All dumb-waiter shafts, except such as do not extend more than three stories above the cellar or basement in private dwelling-houses, shall be inclosed in suitable walls of brick or with burnt clay blocks, set in iron frames of proper strength or fireproof blocks strengthened with metal dowels, or such other fireproof material and form of construction as may be approved by the commissioner. Said walls or construction shall extend at least three feet above the roof and be covered with a skylight at least three-fourths the area of the shaft, made with metal frames and glazed. All openings in the inclosure walls or construction shall be provided with self-closing fireproof doors. When the shaft does not extend to the floor level of the lowest story, the bottom of the shaft shall be constructed of fireproof material.

SECTION 4. Elevators or hoists for freight which do not pass the ceiling of the first story may be constructed without fireproof inclosures above the basement. In existing buildings, or in buildings hereafter erected in compliance with this act, frieght and passenger elevators without fireproof inclosures may be placed in areas or hallways which are continuous and unbroken, no part being separated from another part by an intervening floor: provided, that no additional draft of air is thereby created.

Section 5. Elevators in Staircase Inclosures. — Open grillwork inclosures for passenger elevators, not extending below the level of the first floor, may be erected in staircase inclosures in buildings where the entire space occupied by the stairs and elevator is inclosed in brick or stone walls.

Section 6. Elevators in Existing Hotels. — In every non-fireproof building, used or occupied as a hotel, in which there is an elevator not inclosed in fireproof shafts, such elevator shall be inclosed in suitable walls, constructed and arranged as in this law required for elevator shafts.

Section 7. Screen Under Elevator Sheaves. — Immediately under the sheaves at the top of every elevator shaft in any building there shall be provided and placed a substantial grating or screen of iron or steel, of such construction as shall be approved by the Building Department.

Section 8. Every elevator shall be provided with some sufficient arrangement to prevent the falling of the car in case of accident.

Section 9. Inspection of Elevators. — The commissioner shall cause an inspection of elevators carrying passengers or employees to be made at least at once every six months, and shall make regulations for the inspection of such elevators with a view to safety; and shall also prescribe suitable qualifications for persons who are placed in charge of the running of such elevators. The regulations shall require any repairs found necessary to any such elevators to be made without delay by the owner or lessee. In case defects are found to exist which endanger life or limb by the continued use of such elevator, then, upon notice from the Building Department, the use of such elevator shall cease, and it shall not again be used until a certificate shall be first obtained from said Building Department that such elevator has been made safe. No person shall employ or permit any person to be in charge of running any passenger elevator who does not possess the qualifications prescribed therefor.

Every freight elevator or lift shall have a notice posted thereon as follows: *Persons riding on this elevator do so at their own risk.*

Section 10. Windows or outside openings of every elevator shaft shall have three vertical, red-painted iron bars, equally dividing the opening. All openings to elevator wells shall have self-closing and self-fastening doors.

ARTICLE XIII.

FIRE - ESCAPES AND FIRE - PROOF SHUTTERS AND DOORS.

SECTION 1. **Fire-Escapes.** — Every building already erected, or that may hereafter be erected, more than two stories in height, occupied and used as a hotel or lodging-house, and every boarding-house, having more than fifteen sleeping-rooms above the basement story, and every factory, mill, manufactory or workshop, hospital, asylum or institution for the care or treatment of individuals, and every building two stories and over in height used or occupied as a store or workroom, and every building in whole or in part occupied or used as a school or place of instruction or assembly, and every office building two stories or more in height, shall be provided with such good and sufficient fire-escape, stairways, or other means of egress in case of fire as shall be directed by the Building Department; and said Department shall have full and exclusive power and authority within said town to direct fire-escapes and other means of egress to be provided upon and within said building or any of them. The owner or owners of any building upon which a fire-escape is erected shall keep the same in good repair and properly painted. No person shall at any time place any incumbrance of any kind whatsoever before or upon any fire-escape, balcony or ladder.

All buildings requiring fire-escapes shall have stationary iron ladders leading to the scuttle opening in the roof thereof, and all scuttles and ladders shall be kept so as to be ready for use at all times. If a bulkhead is used in place of a scuttle, it shall have stairs with sufficient guard or hand-rail leading to the roof.

SECTION 2. It shall be the duty of every fireman and policeman who shall discover any fire-escape balcony or ladder of any fire-escape incumbered in any way, to forthwith report the same to the officer in command of his company or precinct, and such officer in command shall forthwith cause the occupant of the premises or apartment to which said fire-escape balcony or ladder is attached or for whose use the same is provided, to be notified, either verbally or in writing, to remove such incumbrance and keep the same clear. If said notice shall not be complied with by the removal, forthwith, of such incumbrance, and keeping said fire-escape, balcony or ladder free from incumbrance, then it shall be the duty of said officer to apply to the police magistrate for a warrant for the arrest of the occupant or occupants of the said premises or apartment of which the fire-escape forms a part, and the said parties shall be brought before the said magistrate, as for a misdemeanor. In constructing all balcony fire-escapes, the manufacturer thereof shall securely fasten thereto, in a conspicuous place, a cast-iron plate, having suitable raised letters on the same, to read as follows: *Notice: Any person placing any incumbrance on this balcony is liable to a penalty of not exceeding one hundred dollars.*

SECTION 3. Fireproof Shutters and Doors. — Every building which is more than two stories in height, excepting dwelling-houses, hotels, schoolhouses, and churches, shall have doors, blinds, or shutters on every exterior window and opening above the first story thereof, excepting on the front openings of buildings fronting on streets which are more than thirty feet in width, or where no other buildings are within thirty feet of such openings, which doors, blinds, or shutters shall be constructed of pine or other soft wood of two thicknesses of matched boards at right angles with each other, and securely covered with tin, on both sides and edges, with folded, lapped joints, the nails for fastening the same being driven inside the lap; the hinges and bolts or latches shall be secured or fastened to the door or shutter after the same has been covered with the tin, and such doors or shutters shall be hung upon an iron frame, independent of the woodwork of the windows and doors, or two iron hinges securely fastened in the masonry; or such frames, if of wood, shall be covered with tin in the same manner as the doors and shutters. All shutters opening on fire-escapes, and at least one row, vertically, in every three rows on the front window openings above the first story of any building, shall be so arranged that they can be readily opened from the outside by firemen. All rolling iron or steel shutters hereafter placed in the first story of any building shall be counterbalanced so that said rolling shutters may be readily opened by the firemen. No building hereafter erected shall have iron or steel shutters to windows over the first story. All windows and openings above the first story of any building may be provided with other suitable protection, or may be exempted from having shutters by the commissioner. All buildings specified in this section, hereafter erected or altered, having openings in interior walls, shall be provided with suitable fireproof doors where deemed necessary by the commissioner. All occupants of buildings shall close all exterior and interior fireproof shutters, doors and blinds at the close of the business of each day.

ARTICLE XIV.

FIREPROOF BUILDINGS.

SECTION 1. Fireproof buildings shall be constructed with walls of brick, stone, Portland cement, concrete, iron, or steel, in which wood beams or lintels shall not be placed, and in which the floors and roofs shall be of materials provided for in Section 2 of this article. The stairs and staircase landings shall be built entirely of brick, stone, Portland cement concrete, iron or steel. No woodwork or other inflammable material shall be used in any of the partitions, furrings, or ceilings in any such fireproof buildings, excepting, however, that the doors and windows and their frames, the trims, the casings, the interior finish when filled solid at the back with fireproof material, and the floor boards and sleepers directly thereunder, may be of wood, but the space between the sleepers shall be solidly filled with fireproof materials and extend up to the under side of the floor boards.

All hall partitions or permanent partitions between rooms in fireproof buildings shall be built of fireproof material, and shall not be started on wood sills, nor on wood floor boards, but be built upon the fireproof construction of the floor and extend to the fireproof beam filling above. The tops of all door and window openings in such partitions shall be at least twelve inches below the ceiling line.

Section 2. The following materials shall, for the purposes of this law, be deemed to be incombustible, fireproof or fire-resisting materials:

a. Brickwork constructed of good bricks well burnt, hard and sound, properly bonded, and solidly put together with good mortar, compounded of good lime or cement, or both, and sharp, clean sand.

b. Granite and other stone suitable for building purposes by reason of its solidity and durability.

c. Iron, steel, and copper.

d. Concrete composed of broken brick, stone chippings, or ballast and lime cement, or calcined gypsum when used for filling in between joists of floors.

e. Any fire-resisting material from time to time approved in writing by the Building Department.

ARTICLE XV.

IRON AND STEEL CONSTRUCTION.

Section 1. Skeleton Construction. — Where columns are used to support iron or steel girders carrying inclosure walls, the said columns shall be of cast iron, wrought iron or rolled steel, and on their exposed outer and inner surfaces be constructed to resist fire by having a casing of brickwork not less than eight inches in thickness on the outer surfaces, nor less than four inches in thickness on the inner surfaces, and all bonded into the brickwork of the inclosure walls. The exposed sides of the iron or steel girders shall be similarly covered in with brickwork not less than four inches in thickness on the outer surfaces and tied and bonded, but the extreme outer edge of the flanges of beams, or plates or angles connected to the beams, may project to within two inches of the outside surface of the brick casing. The inside surfaces of girders may be similarly covered with brickwork, or if projecting inside of the wall, they shall be protected by terra-cotta, concrete or other fireproof material. Girders for the support of the inclosure walls shall be placed at the floor line of each story.

SECTION 2. Steel and Wrought Iron Columns. — No part of a steel or wrought iron column shall be less than one-quarter of an inch thick. No wrought iron or rolled steel column shall have an unsupported length of more than forty times its least lateral dimension, or diameter, except as modified by Section 15 of Article IV., and also except in such cases as the commissioner in writing, may specially allow a greater unsupported length. The ends of all columns shall be faced to a plane surface at right angles to the axis of the columns, and the connection between them shall be made with splice plates. The joint may be effected by rivets of sufficient size and number to transmit the entire stress, and then the splice plates shall be equal in sectional area to the area of column spliced. When the section of the columns to be spliced are such that spliced plates cannot be used, a connection formed of plates and angles may be used, designed to properly distribute the stress. No material, whether in the body of the column or used as lattice-bar or stay-plate, shall be used in any wrought iron or steel column of less thickness than one-thirty-second of its unsupported width measured between centres of rivets transversely, or one-sixteenth the distance between centres of rivets in the direction of the stress. Stay-plates are to have not less than four rivets, and are to be spaced so that the ratio of length by the least radius of gyration of the parts connected does not exceed forty; the distance between nearest rivets of two stay-plates shall in this case be considered as length. Steel and wrought iron columns shall be made in one, two or three-story lengths, and the material shall be rolled in one length wherever practicable, to avoid intermediate splices. Where any part of the section of a column projects beyond that of the column below, the difference shall be made up by filling plates secured to column by the proper number of rivets. Shoes of iron or steel, as described for cast iron columns, or built shoes of plates and shapes may be used, complying with same requirements.

SECTION 3. Cast Iron Columns. — Cast iron columns shall not have less diameter than five inches or less thickness than three-quarters of an inch. Nor shall they have an unsupported length of more than twenty times their least lateral dimensions or diameter, except as modified by Section 15, Article IV., of this law, and except the same may form part of an elevator inclosure or staircase, and also except in such cases as the commissioner may specially allow a greater unsupported length. All cast iron columns shall be of good workmanship and material. The top and bottom flanges, seats and lugs shall be of ample strength, reinforced by fillets and brackets; they shall be not less than one inch in thickness when finished. All columns must be faced at the ends to a true surface perpendicular to the axis of the column. Column joints shall be secured by not less than four bolts each, not less than three-quarters of an inch in diameter. The holes for these bolts shall be drilled to a template. The core of a column below a joint shall be not larger than the core of the column above and the metal shall be tapered down for a distance of not less than six inches, or a joint plate may be inserted of sufficient strength to distribute the load. The thickness of metal shall be not less than one-twelfth the diameter or the greatest lateral dimension of cross section, but never less than three-quarters of an inch. Wherever the core of a cast iron column has shifted more than one-fourth the thickness of the shell the strength shall be computed, assuming the thickness of metal all around equal to the thinnest part, and the column shall be condemned if this computation shows the strength to be less than required by this law. Wherever blow-holes or imperfections are found in a cast iron column which reduces the area of the cross section at that point more than ten per cent., such column shall be condemned. Cast iron posts or columns not cast with one open side or back, before being set up in place, shall have a three-eighths of an inch hole drilled in the shaft of each post or column, by the manufacturer or contractor furnishing the same, to exhibit the thickness of the castings; and any other similar sized hole or holes which the commissioners of buildings may require shall be drilled in the said posts or columns by the said manufacturer or contractor at his own expense.

Iron or steel shoes or plates shall be used under the bottom tier of columns to properly distribute the load on the foundation. Shoes shall be planned on top.

SECTION 4. Double Columns. — In all buildings hereafter erected or altered, where any iron or steel column or columns are used to support a wall or part thereof, whether the same be an exterior or an interior wall, and columns located below the level of the sidewalk which are used to support exterior walls or arches over vaults, the said column or columns shall be either constructed double, that is, an outer and an inner column, the inner column alone to be of sufficient strength to sustain safely the weight to be imposed thereon, and the outer columns shall be one inch shorter than the inner columns, or such other iron or steel column of sufficient strength and protected with not less than two inches of fireproof material securely applied, except that double or protected columns shall not be required for walls fronting on streets or courts.

SECTION 5. Party Wall Posts. — If iron or steel posts are to be used as party posts in front of a party wall, and intended for two buildings, then the said posts shall be not less in width than the thickness of the party wall, nor less in depth than the thickness of the wall to be supported above. Iron or steel posts in front of side, division or party walls shall be filled up solid with masonry, and made perfectly tight between the posts and walls. Intermediate posts may be used, which shall be sufficiently strong, and the lintels thereon shall have sufficient bearings to carry the weight above with safety.

SECTION 6. Plates between Joints of Open Back Columns. — Iron or steel posts or columns with one or more open sides and backs shall have solid iron plates on top of each, excepting where pierced for the passage of pipes.

SECTION 7. Steel and Iron Girders. — Rivets in flanges shall be spaced so that the least value of a rivet for either shear or bearing is equal or greater than the increment of strain due to the distance between adjoining rivets. All other rules given under riveting shall be followed. The length of rivets between heads shall be limited to four times the diameter. The compression flange of plate girders shall be secured against buckling, if its length exceeds thirty times its width. If splices are used, they shall fully make good the members spliced in either tension or compression. Stiffeners shall be provided over supports and under concentrated loads; they shall be of sufficient strength, as a column, to carry the loads, and shall be connected with a sufficient number of rivets to transmit the stresses into the web plate. Stiffeners shall fit so as to support the flanges of the girders. If the unsupported depth of the web plate exceeds sixty times its thickness, stiffeners shall be used at intervals not exceeding one hundred and twenty times the thickness of the web.

SECTION 8. Rolled Steel and Wrought Iron Beams Used as Girders. — When rolled steel or wrought iron beams are used in pairs to form a girder, they shall be connected together by bolts and iron separators at intervals of not more than five feet. All beams twelve inches and over in depth shall have at least two bolts to each separator.

SECTION 9. Cast Iron Lintels. — Cast iron lintels shall not be used for spans exceeding sixteen feet. Cast iron lintels or beams shall be not less than three-quarters of an inch in thickness in any of their parts.

SECTION 10. Plates under Ends of Lintels and Girders. — When the lintels or girders are supported at the ends by brick walls or piers, they shall rest upon cut granite or bluestone blocks at least ten inches thick, or upon cast iron plates of equal strength by the full size of the bearings. In case the opening is less than twelve feet, the stone blocks may be five inches in thickness, or cast iron plates of equal strength by the full size of the bearings, may be used, provided that in all cases the safe loads do not exceed those fixed by Section 16, Article IV., of this law.

Section 11. Rolled Steel and Wrought Iron Floor and Roof Beams. — All rolled steel and wrought iron floor and roof beams used in buildings shall be of full weight, straight and free from injurious defects. Holes for tie rods shall be placed as near the thrust of the arch as practicable. The distance between tie rods in floors shall not exceed eight feet, and shall not exceed eight times the depth of floor beams twelve inches and under. Channels or other shapes where used as skewbacks shall have a sufficient resisting moment to take up the thrust of the arch. Bearing plates of stone or metal shall be used to reduce the pressure on the wall to the working stress. Beams resting on girders shall be securely riveted or bolted to the same; where joined on a girder, tie straps of one-half inch net sectional area shall be used, with rivets or bolts to correspond. Anchors shall be provided at the ends of all such beams bearing on walls.

Section 12. Templates under Ends of Steel or Iron Floor Beams. — Under the ends of all iron or steel beams, where they rest on the walls, a stone or cast iron template shall be built into the wall. Templates under ends of steel or iron beams shall be of such dimensions as to bring no greater pressure upon the brickwork than that allowed by Section 16, Article IV., of this law. When rolled iron or steel floor beams, not exceeding six inches in depth, are placed not more than thirty inches on centres, no templates shall be required.

Section 13. Framing and Connecting Structural Work. — All iron or steel trimmer beams, headers and tail beams shall be suitably framed and connected together, and the iron or steel girders, columns, beams, trusses and all other iron work of all floors and roofs shall be strapped, bolted, anchored and connected together, and to the walls.

All beams framed into and supported by other beams or girders shall be connected thereto by angles or knees of a proper size and thickness, and have sufficient bolts or rivets in both legs of each connecting angle to transmit the entire weight or load coming on the beam to the supporting beam or girder. In no case shall the shearing value of the bolts or rivets or the bearing value of the connection angles, provided for in Section 16, Act. IV. of this law, be exceeded.

Section 14. Riveting or Structural Steel and Wrought Iron Work. — The distance from centre of a rivet hole to the edge of the material shall be not less than —

⅝ of an inch for ½ inch rivets,
⅞ " ⅝ "
1⅛ " ¾ "
1⅜ " ⅞ "
1½ " 1 "

Wherever possible, however, the distance shall be equal to two diameters. All rivets, wherever practicable, shall be machine driven. The rivets in connection shall be proportioned and placed to suit the stresses. The pitch of rivets shall never be less than three diameters of the rivet, nor more than six inches. In the direction of the stress it shall not exceed sixteen times the least thickness of the outside member. At right angles to the stress it shall not exceed thirty-two times the least thickness of the outside member. All holes shall be punched accurately, so that upon assembling a cold rivet will enter the hole without straining the material by drifting. Occasional slight errors shall be corrected by reaming. The rivets shall fill the holes completely; the heads shall be hemispherical and concentric with the axis of the rivet. Gussets shall be provided wherever required of sufficient thickness and size to accommodate the number of rivets necessary to make a connection.

Section 15. Bolting of Structural Steel and Wrought Iron Work. — Where riveting it not made mandatory, connections may be effected by bolts. These bolts shall be of wrought iron or mild steel, and they shall have U. S. Standard threads. The threads shall be full and clean, the nut shall be truly concentric with the bolt and the thread shall be of sufficient length to allow the nut to be screwed up tightly. When bolts go through bevel flanges, bevel washers to match shall be used so that head and nut of bolt are parallel. When bolts are used for suspenders, the working stresses shall be reduced for wrought iron to 10,000 pounds and for steel to 14,000 pounds per square inch of net area, and the load shall be transmitted into the head or nut by strong washers distributing the pressure evenly over the entire surface of the same. Turned bolts in reamed holes shall be deemed a substitute for field rivets.

Section 16. Steel and Wrought Iron Trusses. — Trusses shall be of such design that the stresses in each member can be calculated. All trusses shall be held rigidly in position by efficient systems of lateral and sway bracing, struts being spaced so that the maximum limit of length to least radius of gyration, established in Section 2, Art. XV. of this law, is not exceeded. Any member of a truss subjected to transverse stress, in addition to direct tension or compression, shall have the stresses causing such strain added to the direct stresses coming on the member, and the total stresses thus formed shall in no case exceed the working stresses stated in Section 16, Article IV., of this law.

Section 17. Riveted Steel and Wrought Iron Trusses. — For tension members, the actual net area only, after deducting rivet holes, one-eighth inch larger than the rivets, shall be considered as resisting the stress. If tension members are made of angle irons riveted through one flange only, only that flange shall be considered in proportioning areas. Rivets to be proportioned as described in Section 14 of Article XV. If the axes of two adjoining web members do not intersect within the line of the chords, sufficient area shall be added to the chord to take up the bending strains. No bolts shall be used in the connections of riveted trusses, excepting when riveting is impracticable, and then the holes shall be drilled or reamed.

SECTION 18. Steel and Iron Pin-Connected Trusses. — The bending stresses on pins shall be limited to 20,000 pounds for steel and 15,000 pounds for iron. All compression members in pin-connected trusses shall be proportioned, using seventy-five per cent. of the permissible working stress for columns. The heads of all eye-bars shall be made by upsetting or forging. No weld will be allowed in the body of the bar. Steel eye-bars shall be annealed. Bars shall be straight before boring. All pin-holes shall be bored true, and at right angles to the axis of the members, and must fit the pin within one thirty-second of an inch. The distances of pin-holes from centre to centre for corresponding members shall be alike, so that, when piled upon one another, pins will pass through both ends without forcing. Eyes and screw end shall be so proportioned that upon test to destruction, fracture will take place in the body of the member. All pins shall be accurately turned. Pin plates shall be provided wherever necessary to reduce the stresses on pins to the working stresses prescribed in Section 16 of Article IV. These pin plates shall be connected to the members by rivets of sufficient size and number to transmit the stresses without exceeding working stresses. All rivets in members of pin-connected trusses shall be machine driven. All rivets in pin plates which are necessary to transmit stress shall be also machine driven. The main connections of members shall be made by pins. Other connections may be made by bolts. If there is a combination of riveted and pin-connected members in one truss, these members shall comply with the requirements for pin-connected trusses; but the riveting shall comply with the requirements of Section 17 of this article.

SECTION 19. Iron and Other Metal Fronts to be Filled in. — All cast iron or metal fronts shall be backed up or filled in with masonry of the thicknesses provided for in Sections 5 and 6 of Article VI.

SECTION 20. Painting of Structural Metal Work. — All structural metal work shall be cleaned of all scale, dirt and rust and be thoroughly coated with one coat of paint. Cast iron columns shall not be painted until after inspection by the Building Department. After erection, all work shall be painted at least one additional coat. All iron or steel used under water shall be inclosed with concrete.

ARTICLE XVI.

PUBLIC BUILDINGS, THEATRES AND PLACES OF ASSEMBLAGE.

SECTION 1. **Public Buildings.** — In all buildings of a public character, such as hotels, churches, theatres, restaurants, railroad depots, public halls and other buildings used or intended to be used for purposes of public assembly, amusement or instruction, and including department stores and other business and manufacturing buildings where large numbers of people are congregated, the halls, doors, stairways, seats, passageways and aisles and all lighting and heating appliances and apparatus shall be arranged as the Building Department shall direct to facilitate egress in cases of fire or accident, and to afford the requisite and proper accommodation for the public protection in such cases. All aisles and passageways in said buildings shall be kept free from camp stools, chairs, sofas and other obstructions, and no person shall be allowed to stand in or occupy any of said aisles or passageways, during any performance, service, exhibition, lecture, concert, ball or any public assemblage. The commissioner may at any time serve a written or printed notice upon the owner, lessee or manager of any of said buildings, directing any act or thing to be done or provided in or about the said buildings and the several appliances therewith connected, such as halls, doors, stairs, windows, seats, aisles, fire-walls, fire apparatus and fire-escapes, as he may deem necessary.

SECTION 2. **Theatres and Places of Public Amusement.** — Every theatre, opera house or other building intended to be used for theatrical or operatic purposes, or for public entertainments of any kind hereafter erected, for the accommodation of more than three hundred persons, shall be built to comply with the requirements of this section. No building which, at the time of the passage of this law is not in actual use for theatrical or operatic purposes, and no building hereafter erected not in conformity with the requirements of this section, shall be used for theatrical or operatic purposes, or for public entertainments of any kind until the same shall have been made to conform to the requirements of this section. And no building hereinbefore described shall be opened to the public for theatrical or operatic purposes or for public entertainments of any kind until the Building Department shall have approved the same in writing as conforming to the requirements of this section. Every such building shall have at least one front on the street, and in such front there shall be suitable means of entrance and exit for the audience. In addition to the aforesaid entrances and exits on the street, there shall be reserved for service in case of an emergency, an open court or space on the side not bordering on the street, where said building is located on a corner lot, and on both sides of said building where there is but one frontage on the street. The width of such open court or courts shall be not less than seven feet where the seating capacity is not over one thousand people; above one thousand and not more than eighteen hundred people, eight feet in width, and above eighteen hundred people, ten feet in width. Said open court or courts shall begin on a line with or near the proscenium wall and shall extend the length of the auditorium proper, to or near the wall separating the same from the entrance lobby or vestibule. A separate and distinct corridor shall continue to the street from each open court through such superstructure as may be built on the street side of the auditorium, with continuous walls of brick or fireproof materials on each side the entire length of said corridor or corridors, and the ceiling and floors shall be fireproof. Said corridor or corridors shall not be reduced in width to more than three feet less than the width of the open court or courts and there shall be no projection in the same, the outer openings to be provided with doors or gates opening toward the street. During the performance the doors or gates in the corridors shall be kept open by proper fastenings; at other times they may be closed and fastened by movable bolts or locks. The said open courts and corridors shall not be used for storage purposes or for any purpose whatsoever except for exit and entrance from and to the auditorium and stage, and must be kept free and clear during performances. The level of said corridors at the front entrance to the building shall be not greater than one step above the level of the sidewalk where they begin at the street entrance. The entrance of the main front of the building shall be not on a higher level from the sidewalk than four steps, unless approved by the Building Department. To overcome any difference of level in and between courts, corridors, lobbies, passages and aisles on the ground floor, gradients shall be employed of not over one foot in twelve feet with no perpendicular rises. From the auditorium, opening into the said open courts or on the side street, there shall be not less than two exits on each side in each tier from and including the parquet and each and every gallery. Each exit shall be at least five feet in width in the clear and provided with doors of iron or wood; if of wood, the doors shall be constructed as hereinbefore in this law described. All of said doors shall open outwardly and shall be fastened with movable bolts, the bolts to be kept drawn during performances. There shall be balconies not less than four feet in width to the said open court or courts at each level or tier above the parquet, on each side of the auditorium, of sufficient length to embrace the two exits, and from said balconies there shall be staircases extending to the ground level, with a rise of not over eight and one-half inches to a step, and not less than nine inches tread, exclusive of the nosing. The staircase from the upper balcony to the next below shall be not less than thirty-six inches in width in the clear, and from the first balcony to the ground three feet in width in the clear where the seating capacity of the auditorium is for one thousand people or less, three feet and six inches in the clear where above one thousand and not more than eighteen hundred people, and four feet in the clear where above eighteen hundred people and not more than twenty-five hundred people, and not less than four feet six inches in the clear where above twenty-five hundred people. All the before-mentioned balconies and staircases shall be constructed of iron throughout, including the floors, and of ample strength to sustain the load to be carried by them, and they shall be covered with a metal hood or awning, to be constructed in such manner as shall be approved by the Building Department. Where one side of the building borders on the street there shall be balconies and staircases of like capacity and kind, as before mentioned, carried to the ground. When located on a corner lot that portion of the premises bordering on the side street and not required for the uses of the theatre may, if such portion be not more than twenty-five feet in width, be used for offices, stores or apartments, provided the walls separating this portion from the theatre proper are carried up solidly to and through the roof, and that a fireproof exit is provided for the theatre, on each tier, equal to the combined width of exits opening on opposite sides in each tier, communicating with balconies and staircases leading to the street in manner provided elsewhere in this section; said exit passages shall be entirely cut off by brick walls from said offices, stores or apartments, and the floors and ceilings in each tier shall be fireproof. Nothing herein contained shall prevent a roof garden, art gallery, or rooms for similar purposes being placed above a theatre or public building, provided the floor of the same forming the roof over such theatre or building shall be constructed of iron or steel and fireproof materials, and that said floor shall have no covering boards or sleepers of wood, but be of tile or cement. Every roof over said garden or rooms shall have all supports and rafters of iron or steel, and be covered with glass or fireproof materials, or both, but no such roof garden, art gallery, or room for any public purpose shall be placed over or above that portion of any theatre or other building which is used as a stage. No workshop, storage or general property room shall be allowed above the auditorium or stage, or under the same, or in any of the fly galleries. All of said rooms or shops may be located in the rear or at the side of the stage, but in such cases they shall be separated from the stage by a brick wall, and the openings leading into said portions shall have fireproof doors on each side of the openings, hung to iron eyes built into the wall. No portion of any building hereafter erected or altered, used or intended to be used for theatrical or other purposes as in this section specified, shall be ocupied or used as a hotel, boarding or lodging-house, factory, workshop or manufactory, or for storage purposes, except as may be hereafter specially provided for. Said restriction relates not only to that portion of the building which contains the auditorium and the stage, but applies also to the entire structure in conjunction therewith. No store or room contained in the building, or the offices, stores or apartments adjoining, as aforesaid, shall be let or used for carrying on any business dealing in articles designated specially hazardous in the classification of the Boston Board of Fire Underwriters, or for manufacturing purposes. No lodging accommodations shall be allowed in any part of the building communicating with the auditorium. Interior walls built of fireproof materials shall separate the auditorium from the entrance vestibule, and from any room or rooms over the same, also, from any lobbies, corridors, refreshment or other rooms. All staircases for the use of the audience shall be inclosed with walls of brick or of fireproof materials approved by the Building Department, in the stores through which they pass, and the openings to said staircases from each tier shall be the full width of said staircase. No door shall open immediately upon a flight of stairs, but a landing at least the width of the door shall be provided between such stairs and such door. A fire wall built of brick shall separate the auditorium from the stage and the same shall extend at least four feet above the stage roof, or the auditorium roof, if the latter be the higher, and shall be coped. Above the proscenium opening there shall be an iron girder of sufficient strength to safely support the load above and the same shall be covered with fireproof materials to protect it from the heat. Should there be constructed an orchestra over the stage, above the proscenium opening, the said orchestra shall be placed on the auditorium side of the proscenium fire wall, and shall be entered only from the auditorium side of said wall. The moulded frame around the proscenium opening shall be formed entirely of fireproof materials; if metal be used the metal shall be filled in solid with non-combustible material and securely anchored to the wall with iron. The proscenium opening shall be provided with a fireproof metal curtain, or a curtain of asbestos, or other fireproof material approved by the Building Department, sliding at each end within iron grooves, securely fastened to the brick wall, and extending into such grooves to a depth of not less than six inches on each side of the opening. Said fireproof curtain shall be raised at the commencement of each performance and lowered at the close of said performance, and be operated by approved machinery for that purpose. The proscenium curtains shall be placed at least three feet distant from the footlights at the nearest point. No doorway or opening through the proscenium wall, from the auditorium, shall be allowed above the level of the first floor, and such first floor openings shall have fireproof doors on each face of the wall, and the doors shall be hung so as to be opened from either side at all times. There shall be provided over the stage metal skylights of an area or combined area of at least one-eighth the area of said stage, fitted up with sliding sash and glazed with double thick sheet glass not exceeding one-twelfth of an inch thick, and each pane thereof measuring not less than three hundred square inches, and the whole of which skylight shall be so constructed as to open instantly on the cutting or burning of a hempen cord, which shall be arranged to hold said skylights closed, or some other equally simple approved device for opening them may be provided. Immediately underneath the glass of said skylights there shall be wire netting, but wire glass shall not be used in lieu of this requirement. All that portion of the stage not comprised in the working of scenery, traps and other mechanical apparatus, for the presentation of a scene, usually equal to the width of the proscenium opening, shall be built of iron or steel beams filled in between with fireproof material, and all girders for the support of said beams shall be of wrought iron or rolled steel. The fly galleries entire, including pin rails, shall be constructed of iron or steel, and the floors of said galleries shall be composed of iron or steel beams filled with fireproof materials, and no wood boards or sleepers shall be used as covering over beams, but the said floors shall be entirely fireproof. The rigging loft shall be fireproof. All stage scenery, curtains and decorations made of combustible material, and all woodwork on or about the stage shall be painted or saturated with some non-combustible material, or otherwise rendered safe against fire, and the finishing coats of paint applied to all woodwork throughout the entire building shall be of such kind as will resist fire to the satisfaction of the Building Department. The roof over the auditorium and the entire main floor of the auditorium and vestibule, also the entire floor of the second story of the front superstructure over the entrance, lobby and corridors, and all galleries and supports for the same in the auditorium shall be constructed of iron or steel and fireproof materials, not excluding the use of wood floor boards and necessary sleepers to fasten the same to, but such sleepers shall not mean timbers of support, and the space between the sleepers, excepting the portion under the stepping in the galleries, which shall be properly fire-stopped, shall be solidly filled with incombustible material up to the underside of the floor boards. The fronts of each gallery shall be formed of fireproof materials, except the capping, which may be made of wood. The ceiling under each gallery shall be entirely formed of fireproof materials. The ceiling of the auditorium shall be formed of fireproof materials. All lathing, whenever used, shall be of wire or other metal. The partitions in that portion of the building which contains the auditorium, the entrance and vestibule, and every room and passage devoted to the use of the audience, shall be constructed of fireproof materials, including the furring of outside or other walls. None of the walls or ceilings shall be covered with wood sheathing, canvas or any combustible material. But this shall not exclude the use of wood wainscoting to a height not to exceed six feet, which shall be filled in solid between the wainscoting and the wall with fireproof materials. The walls separating the actors' dressing-rooms from the stage, and the partitions dividing the dressing-rooms, together with the partitions of every passageway from the same to the stage, and all other partitions on or about the stage shall be constructed of fireproof material approved by the Building Department. All doors in any of said partitions shall be fireproof. All shelving and cupboards in each and every dressing-room, property-room or other storage-rooms, shall be constructed of metal, slate or some fireproof material. Dressing-rooms may be placed in the fly galleries, provided that proper exits are secured therefrom to the fire-escapes in the open courts, and that the partitions and other matters pertaining to dressing-rooms shall conform to the requirements herein contained, but the stairs leading to the same shall be fireproof. All dressing-rooms shall have an independent exit leading directly into a court or street, and shall be ventilated by windows in the external wall; and no dressing-room shall be more than one story below street level. All windows shall be arranged to open, and none of the windows in outside walls shall have fixed sashes, iron grills or bars. All seats in the auditorium, excepting those contained in boxes, shall be not less than thirty-two inches from back to back, measured in a horizontal direction, and firmly secured to the floor. No seat in the auditorium shall have more than six seats intervening between it and an aisle on either side. No stool or seat shall be placed in any aisle. All platforms in galleries formed to receive the seats shall be not more than twenty-one inches in height of riser, nor less than thirty-two inches in width of platform. All aisles on the respective floors in the auditorium having seats on both sides of same shall be not less than three feet wide where they begin, and shall be increased in width towards the exits in the ratio of one and one-half inches to five running feet. Aisles having seats on one side only shall be not less than two feet wide at their beginning and increased in width the same as aisles having seats on both sides. The aggregate capacity of the foyers, lobbies, corridors, passages and rooms for the use of the audience, not including aisle space between seats, shall, on each floor or gallery, be sufficient to contain the entire number to be accommodated on said floor or gallery, in the ratio of one hundred and fifty superficial feet of floor room for every one hundred persons. Gradients or inclined planes shall be employed instead of steps where possible to overcome slight difference of level in or between aisles, corridors and passages. Every theatre accommodating three hundred persons shall have at least two exits; when accommodating five hundred persons, at least three exits shall be provided; these exits not referring to or including the exits to the open court at the side of the theatre. Doorways of exit or entrance for the use of the public shall be not less than five feet in width, and for every additional one hundred persons or portions thereof to be accommodated, in excess of five hundred, an aggregate of twenty inches additional exit width must be allowed. All doors of exit or entrance shall open outwardly and be hung to swing in such a manner as not to become an obstruction in a passage or corridor, and no such doors shall be closed and locked during any representation, or when the building is open to the public. Distinct and separate places of exit and entrance shall be provided for each gallery above the first. A common place of exit and entrance may serve for the main floor of the auditorium and the first gallery, provided its capacity be equal to the aggregate capacity of the outlets from the main floor and the said gallery. No passage leading to any stairway communicating with any entrance or exit shall be less than four feet in width in any part thereof. All stairs within the building shall be constructed of fireproof material throughout. Stairs from balconies and galleries shall not communicate with the basement or cellar. All stairs shall have treads of uniform width and risers of uniform height throughout in each flight. Stairways serving for the exit of fifty people shall be at least four feet wide between railings or between walls, and for every additional fifty people to be accommodated six inches must be added to their width. The width of all stairs shall be measured in the clear between handrails. In no case shall the risers of any stairs exceed seven and a half inches in height, nor shall the treads, exclusive of nosings, be less than ten and one-half inches wide in straight stairs. No circular or winding stairs for the use of the public shall be permitted. Where the seating capacity is for more than one thousand people, there shall be at least two independent staircases, with direct exterior outlets provided for each gallery in the auditorium, where there are not more than two galleries, and the same shall be located on opposite sides of said galleries. Where there are more than two galleries, one or more additional staircases shall be provided, the outlets from which shall communicate directly with the principal exit or other exterior outlets. All said staircases shall be of width proportionate to the seating capacity as elsewhere herein prescribed. Where the seating capacity is for one thousand people or less, two direct lines of staircases only shall be required, located on opposite sides of the galleries, and in both cases shall extend from the sidewalk level to the upper gallery, with outlets from each gallery to each of said staircases. At least two independent staircases with direct exterior outlets shall also be provided for the service of the stage, and shall be located on the opposite sides of the same. All inside stairways leading to the upper galleries of the auditorium shall be inclosed on both sides with walls of fireproof materials. Stairs leading to the first or lower gallery may be left open on one side, in which case they shall be constructed as herein provided for similar stairs leading from the entrance hall to the main floor of the auditorium. But in no case shall stairs leading to any gallery be left open on both sides. When straight stairs return directly on themselves, a landing of the full width of both flights without any steps shall be provided. The outer line of landings shall be curved to a radius of not less than two feet, to avoid square angles. Stairs turning at an angle shall have a proper landing without winders introduced at said turn. In stairs, when two side flights connect with one main flight, no winders shall be introduced, and the width of the main flight shall be at least equal to the aggregate width of the side flights. All stairs shall have proper landings introduced at convenient distances. All inclosed staircases shall have, on both sides, strong hand-rails firmly secured to the wall about three inches distant therefrom and about three feet above the stairs, but said hand-rails shall not run on level platforms and landings where the same is more in length than the width of the stairs. All staircases eight feet and over in width shall be provided with a centre hand-rail of metal, not less than two inches in diameter, placed at a height of about three feet above the centre of the treads, and supported on wrought metal or brass standards of sufficient strength, placed not nearer than four feet nor more than six feet apart, and securely bolted to the treads or risers of stairs, or both, and at the head of each flight of stairs, on each landing, the post or standard shall be at least six feet in height, to which the rail shall be secured. Every steam boiler which may be required for heating or other purposes shall be located outside of the building, and the space allotted to the same shall be inclosed by walls of masonry on all sides, and the ceiling of such space shall be constructed of fireproof materials. All doorways in said walls shall have fireproof doors. No floor register for heating shall be permitted. No coil or radiator shall be placed in any aisle or passageway used as an exit; but all said coils and radiators shall be placed in recesses formed in the wall or partition to receive the same. All supply, return or exhaust pipes shall be properly incased and protected where passing through floors or near woodwork. Stand-pipes four inches in diameter shall be provided with hose attachments on every floor and gallery, as follows, namely: One on each side of the auditorium in each tier, also on each side of the stage in each .tier, and at least one in the property-room and one in the carpenter's shop, if the same be contiguous to the building. All such stand-pipes shall be kept clear from obstruction. Said stand-pipes shall be separate and distinct, receiving their supply of water direct from the power pump or pumps, and shall be fitted with the regulation couplings of the Fire Department, and shall be kept constantly filled with water by means of an automatic power pump or pumps, of sufficient capacity to supply all the lines of hose when operated simultaneously; and said pump or pumps shall be supplied from the street main and be ready for immediate use at all times during a performance in said building. In addition to the requirements contained in this section, the stand-pipes shall also conform to the requirements ordered by building and fire commissioner. A separate and distinct system of automatic sprinklers, with fusible plugs approved by the Building Department, supplied with water from a tank located on the roof over the stage and not connected in any manner with the stand-pipes shall be placed each side of the proscenium opening and on the ceiling or roof over the stage at such intervals as will protect every square foot of stage surface when said sprinklers are in operation. Automatic sprinklers shall also be placed, wherever practicable, in the dressing-rooms, under the stage and in the carpenter shop, paint-rooms, store-rooms and property-rooms. A proper and sufficient quantity of two and one-half inch hose not less than one hundred feet in length, fitted with the regulation couplings of the Fire Department, and with nozzles attached thereto, and with hose spanners at each outlet, shall always be kept attached to each hose attachment as the fire commissioner may direct. There shall also be kept in readiness for immediate use on the stage at least four casks full of water, and two buckets to each cask. Said casks and buckets shall be painted red. There shall also be provided hand-pumps or other portable fire extinguishing apparatus, and at least four axes, and two twenty-five-foot hooks, two fifteen-foot hooks, and two ten-foot hooks on each tier or floor of the stage. Every portion of the building devoted to the uses or accommodation of the public, also all outlets leading to the streets, and including the open courts and corridors, shall be well and properly lighted during every performance, and the same shall remain lighted, until the entire audience has left the premises. All gas or electric lights in the halls, corridors, lobby or any other part of said buildings used by the audience, except the auditorium, must be controlled by a separate shut-off, located in the lobby and controlled only in that particular place. Gas mains supplying the building shall have independent connections for the auditorium and the stage, and provision shall be made for shutting off the gas from the outside of the building. When interior gas lights are not lighted by electricity, other suitable appliances, to be approved by the Building Department, shall be provided. All suspended or bracket lights surrounded by glass, in the auditorium or in any part of the building devoted to the public, shall be provided with proper wire netting underneath. No gas or electric light shall be inserted in the walls, woodwork, ceilings, or in any part of the building unless protected by fireproof materials. All lights in passages and corridors in said buildings, and wherever deemed necessary by the Building Department, shall be protected with proper wire network. The footlights, in addition to the wire network, shall be protected with a strong wire guard and chain, placed not less than two feet distant from said footlights, and the trough containing said footlights shall be formed of and surrounded by fireproof materials. All border lights shall be constructed according to the best known methods, and subject to the approval of the Building Department, and shall be suspended for ten feet by wire rope. All ducts or shafts used for conducting heated air from the main chandelier, or from any other light or lights, shall be constructed of metal and made double, with an air space between. All stage lights shall have strong metal wire guards or screens not less than ten inches in diameter, so constructed that any material in contact therewith shall be out of reach of the flames of said stage lights, and must be soldered to the fixtures in all cases. The stand-pipes, gas-pipes, electric wires, hose, footlights and all apparatus for the extinguishing or fire or guarding against the same, as in this section specified, shall be in charge and under control of the Fire Department; and the commissioner of said department is hereby directed to see that the arrangements in respect thereto are carried out and enforced. A diagram or plan of each tier, gallery or floor, showing distinctly the exits therefrom, each occupying a space not less than fifteen square inches, shall be printed in black lines in a legible manner on the programme of the performance. Every exit shall have over the same on the inside the word *Exit* painted in legible letters not less than eight inches high.

ARTICLE XVII.

TENEMENT-HOUSE, LODGING-HOUSE AND HOTEL REQUIREMENTS.

SECTION 1. For the purposes of this part of this law certain words are defined for the purposes thereof, as follows:

a. The word tenement-house in this article shall mean and include apartment-houses, lodging-houses and hotels.

b. A yard is an open unoccupied space on the same lot with a tenement-house, between the extreme rear line of the house and the rear line of the lot.

c. A court is an open unoccupied space, other than a yard, on the same lot with a tenement-house. A court not extending to the street or yard is an inner court. A court extending to the street or yard is an outer court. If it extends to the street it is a street court. If it extends to the yard it is a yard court.

d. A shaft includes exterior and interior shafts, whether for air, light, elevator, dumb-waiter, or any other purpose. A vent shaft is one used solely to ventilate or light a water-closet compartment or bathroom.

e. A public hall is a hall, corridor or passageway not within an apartment.

f. A stair hall includes the stair, stair landings, and those portions of the public halls through which it is necessary to pass in going between the entrance floor and the roof.

g. The word shall is always mandatory and not directory, and denotes that the house shall be maintained in all respects according to the mandate, as long as it continues to be a tenement-house.

SECTION 2. Buildings Converted or Altered.—A building not erected for use as a tenement-house, if hereafter converted or altered to such use, shall thereupon become subject to all the provisions of this act affecting tenement-houses hereafter erected.

SECTION 3. Fireproof tenements, When Required.—Every building hereafter erected, altered or converted to use as a tenement-house exceeding three stories or parts of stories in height, excepting as provided for in Section 22 of Article XVIII., shall be a fireproof tenement-house, provided that every building of not more than four stories above the cellar or basement, and not more than fifty feet in height hereafter erected, enlarged or converted to use as a tenement-house for four families or less, may be a second-class building, but shall be plastered on incombustible materials from wall to wall and from floor to ceiling in each story. In no non-fireproof tenement-house, excepting as provided for in Sections 21 and 22 of Article XVIII., shall there be more than one family on each floor. A cellar, the ceiling of which does not extend more than two feet above the curb level is not a story within the meaning of this section.

SECTION 4. Fire-escapes, when ordered by the commissioner, shall open directly from at least one room in each apartment in each story above the ground floor, and when so ordered, may project into the public highway to a distance not greater than four feet beyond the building line.

SECTION 5. The fire-escapes shall consist of outside open iron balconies and stairways. The stairways shall be placed at an angle of not more than sixty degrees, with steps not less than six inches in width and twenty inches in length, and with a rise of not more than nine inches. The balcony on the top floor, except in case of a front fire-escape, shall be provided with a goose neck ladder leading from said balcony to and above the roof.

SECTION 6. Balconies. — The balconies shall not be less than three feet in width, taking in at least one window of each apartment at each story above the ground floor. They shall be below but not more than one foot below the window-sills and extend in front of and not less than nine inches beyond each window. There shall be a landing not less than twenty-four inches square at the head and foot of each stairway. The stairway opening on each platform shall be of a size sufficient to provide clear headway.

SECTION 7. Floors of Balconies. — The floors of balconies shall be of wrought iron or steel slats not less than one and a half inches by three-eighths of an inch, placed not more than one and one-quarter inches apart, and well secured and riveted to iron battens one and a half inches by three-eighths of an inch, not over three feet apart and riveted at the intersection. The openings for stairways in all buildings shall not be less than twenty-one inches wide and thirty-six inches long, and such openings shall not have covers of any kind. The platforms of balconies shall be constructed and erected to safely sustain in all their parts a safe load at a ratio of four to one, of not less than eighty pounds per square foot of surface.

SECTION 8. Railings. — The outside top rail shall extend around the entire length of the platform and in all cases shall go through the wall at each end, and be properly secured by nuts and four-inch square washers at least three-eighths of an inch thick, and no top rail shall be connected at angles by cast iron. The top rail of balconies shall be one and three-quarters inches by one-half inch of wrought iron, or one and a half inch angle iron one-quarter inch thick. The bottom rails shall be one and one-half inches by three-eighths of an inch wrought iron, or one and one-half inch angle iron, one-quarter inch thick, well leaded into the wall. The standards or filling-in bars shall be not less than one-half inch round or square wrought iron, well riveted to the top and bottom rails and platform frame.

Such standards or filling-in bars shall be securely braced by outside brackets at suitable intervals, and shall be placed not more than six inches from centres; the height of railings shall in no case be less than two feet, nine inches.

SECTION 9. Stairways. — The stairways shall be constructed and erected to fully sustain in all their parts a safe load at a ratio of four to one of not less than one hundred pounds per step, with the exception of the tread, which may safely sustain at said ratio a load of two hundred pounds. The treads shall be flat open treads not less than six inches wide and with a rise of not more than nine inches. The stairs shall be not less than twenty inches wide. The strings shall be not less than three-inch channels of iron or steel, or other shape equally strong, and shall rest upon and be fastened to a bracket, which shall be fastened through the wall as hereinafter provided. The strings shall be securely fastened to the balcony at the top, and the steps in all cases shall be double riveted or bolted to the strings. The stairs shall have three-quarter inch handrails of wrought iron, well braced.

SECTION 10. Brackets. — The brackets shall be not less than one-half inch by one and three-quarters inches wrought iron placed edgewise, or one and three-quarters inch angle iron, one-quarter inch thick, well braced; they shall be not more than four feet apart, and shall be braced by means of not less than three-quarters of an inch square wrought iron, and shall extend two-thirds of the width of the respective balconies or brackets. The brackets shall go through the wall and be turned down three inches, or be properly secured by nuts and four-inch square washers at least three-eighths of an inch thick. On new buildings the brackets shall be set as the walls are being built. When brackets are put on tenement-houses already erected, the part going through the wall shall not be less than one inch in diameter with screw-nuts and washers not less than five inches square and one-half an inch thick.

SECTION 11. Drop-ladders. — A proper drop-ladder shall be required from the lower balcony when the floor of such balcony is more than fourteen feet above the sidewalk or ground.

SECTION 12. Painting. — All the parts of such fire-escapes shall receive not less than two coats of paint, one in the shop and one after erection. All fire-escape balconies shall contain a plate firmly fastened to the standards or filling-in bars near the top railing in front of each window, such plate to contain in plain, large, prominent, raised letters, each letter to be not less than one-half an inch in length, the following words: *Any one placing any encumbrance on this balcony is liable to a penalty of not exceeding one hundred dollars.*

SECTION 13. In all tenement-houses there shall be at least two independent and sufficient ways of egress, accessible on each floor from each suite of apartments. Such ways of egress shall consist of flights of stairs within the building extending from the lowest to the highest floor, and not more than one flight of stairs shall be placed in the same hallway. Every such way of egress from every such building shall be kept in good repair and unobstructed. More than one such way of egress shall not be required in two-story tenement houses having not more than two apartments on the second floor, provided that at least one-half of the whole number of windows in each apartment are not over fifteen feet above the ground, and provided also, that the commissioner may require, at his discretion, a second way of egress, consisting of an outside stairway or fire escape.

SECTION 14. Fireproof Stairs.—In every tenement-house hereafter erected exceeding three stories and cellar in height, the front stairs shall be fireproof stairs, and such stairs shall be kept free from encumbrance at all times. All front stairways shall have openings through an external wall to the outer air, except as otherwise provided, at least one to each story except the upper and the lower, such openings to have an area of at least five square feet and to be maintained unobstructed; provided, however, that when there shall be within the space inclosed by the stairway and its landing from the second story upwards an open area for light and ventilation whose least horizontal dimensions shall be equal to the width of the stairs but in no case less than three feet, then the aforesaid openings through an exterior wall may be omitted. No bulkhead door shall at any time be locked with a key, but it may be fastened on the inside by movable bolts or hooks.

SECTION 15. Stairs and Public Halls.—Every tenement-house hereafter erected shall have at least one flight of stairs with a guide or hand rail extending from the entrance floor to the roof, and the stairs and public halls therein shall each be at least three feet wide in the clear.

SECTION 16. Stair Halls.—The front stair halls in all non-fireproof as well as fireproof tenement-houses hereafter erected exceeding three stories and cellar in height shall be constructed of fireproof material throughout, except as in this section specified. The risers, stringers and banisters shall be of metal or stone. The treads shall be of metal, slate or stone, or of hard wood not less than two inches thick. Wooden handrails to stairs will be permitted if constructed of hard wood. The floors of all such stair halls shall be constructed of iron or steel beams and fireproof filling and no wooden flooring or sleepers shall be permitted. All windows on such stair halls opening on courts shall be of good quality wire glass in frames of fireproof material. In every non-fireproof tenement-house hereafter erected exceeding three stories and cellar in height, the front stair hall shall be inclosed on all sides with brick walls at least twelve inches thick. The doors opening from such stair halls shall be fireproof and self-closing, and if provided with glass, such glass shall be good quality wire glass. There shall be no transom or movable sash opening from such stair hall or any other part of the house. Each stair hall shall be shut off from all non-fireproof portions of the public halls and from all other non-fireproof parts of the building, on each story, by self-closing fireproof doors, and if glass is used in such doors it shall be of good quality wire glass.

SECTION 17. Entrance Halls. — Every entrance hall in a tenement-house hereafter erected shall be at least three feet six inches wide in the clear, from the entrance up to and including the stair inclosure, and beyond this point at least three feet wide in the clear. In tenement-houses hereafter erected exceeding three stories and cellar in height every entrance hall shall be inclosed with brick walls, except that in a fireproof tenement-house hereafter erected it may be inclosed with terra-cotta blocks not less than four inches thick and with angle iron construction, and shall comply with all the conditions of the preceding sections of this law as to the construction of stair halls. If such entrance hall is the only entrance to more than one flight of stairs, that portion of said hall between the entrance and the first flight of stairs shall be increased one-half in width in every part for each such additional flight of stairs. In every tenement-house hereafter erected access shall be had from the street to the yard, either in a direct line or through a court.

SECTION 18. Partitions, Construction of. — In all non-fireproof tenement-houses hereafter erected, main carrying stud partitions which rest directly over each other shall run through the wooden floor beams and rest upon the plate of the partition below, and shall have the studding filled in solid between the uprights from six inches above to the depth of the floor beams with suitable incombustible materials. In all fireproof tenement-houses hereafter erected, all partitions shall rest directly upon the fireproof floor construction, and extend to the fireproof beam filling above.

SECTION 19. Cellar Stairs in Fireproof Buildings. — In every fireproof tenement-house hereafter erected the stairs communicating between the lowest cellar or other lowest story and the floor next above, if not located underneath the stairs leading to the upper stories, may be placed inside of the said building; provided, that the portion of the cellar or other lowest story into which said stairs lead is entirely shut off by fireproof walls from those portions thereof which are used for the storage of fuel, or in which heating appliances, boilers or machinery are located. All openings in such walls shall be provided with self-closing fireproof doors.

SECTION 20. Closet under First Story Stairs. — In non-fireproof tenement-houses hereafter erected no closet of any kind shall be constructed under any staircase leading from the first story, to the upper stories, but such space shall be left entirely open and kept clear and free from incumbrance.

Section 21. Cellar Entrance. — In every tenement-house hereafter erected there shall be an entrance to the cellar or other lowest story from the outside of the said building. In such tenement-houses, which exceed three stories and cellar in height, unless the entire ceiling and floor above the cellar or other lowest story is constructed fireproof, all receptacles for fuel or storage in the cellar or other lowest story shall be constructed entirely of fireproof materials.

Section 22. Fire Stops. — In tenement-houses hereafter erected, in all walls where wooden furring is used all the courses of brick from the under side of the floor beams to the top of the same shall project a distance of at least two inches beyond the inside face of the wall so as to provide an effective fire stop; and wherever floor beams run parallel to a wall and wooden furring is used such beams shall always be kept at least two and one-half inches away from the inside line of the wall, and the space between the beams and the wall shall be built up solidly with brickwork from the under side of the floor beams to the top of the same, so as to form an effective fire stop.

Section 23. Shafts. — All shafts hereafter constructed in tenement-houses, except in third-class buildings, shall be constructed fireproof throughout, with fireproof self-closing doors at all openings, at each story, except window openings in vent shafts; and, if they extend to the cellar, shall also be inclosed in the cellar with fireproof walls and fireproof self-closing doors at all openings. In no case shall any shaft be constructed of materials in which any inflammable material or substance enters into any of the component parts. But nothing in this section contained shall be so construed as to require such inclosures about elevators or dumb-waiters in the well-hole of stairs where the stairs themselves are inclosed in brick or stone walls, and are entirely constructed of fireproof materials.

Section 24. Combustible Materials. — No tenement-house, nor any part thereof, shall be used as a place of storage for any combustible article except under such conditions as may be prescribed by the Fire Department, under authority of a written permit issued by said department. No tenement-house, nor any part thereof, shall be used as a place of storage for any article dangerous to life or health, nor for the storage of feed, hay, straw, excelsior or cotton, nor for the storage or handling of rags.

Section 25. Bakeries and Fat Boiling. — No bakery and no place of business in which fat is boiled shall be maintained in any tenement-house which is not fireproof throughout, unless the ceiling and side walls of said bakery or of the said place where fat boiling is done are made safe by fireproof materials around the same, and there shall be no openings either by door or window, dumb-waiter shafts or otherwise, between said bakery or said place where fat is boiled in any tenement-house and the other parts of the said building.

SECTION 26. Other Dangerous Businesses. — All transoms and windows opening into halls from any portion of a tenement-house where paint, oil, spirituous liquors or drugs are stored for the purpose of sale or otherwise, shall be glazed with wire glass or they shall be removed and closed up as solidly as the rest of the wall, and all doors leading into any such hall from said portion of said house shall be made fireproof.

SECTION 27. Percentage of Lot Occupied. — No building hereafter erected for or converted to use as a tenement-house, and no building hereafter enlarged or increased in height or area for said purposes, shall occupy above the level of the second floor more than sixty-five one-hundredths part of the area of the lot measured to the middle line of the street or streets or passageways on which it abuts. Every such building shall have on at least two exposures on land of the owner, or as part of public ways, open spaces of at least ten feet in width, which spaces shall have an aggregate length of one foot for every twenty-five feet of superficial area actually occupied by the building. Such spaces shall be open to the sky and shall remain undiminished so long as the building is occupied as a tenement-house. A clear space open from the ground to the sky shall be maintained across the whole rear of every such building not located on two streets forming a corner, and of a depth equal to one-half the width of the street in front of such building; provided, that such space need not exceed the depth of twenty feet; and provided, further, that an equivalent area of open space in the rear or on either side of such building may be provided of different dimensions, with the consent of the commissioner.

SECTION 28. Rear tenements. — No separate tenement-house shall hereafter be erected upon the rear of a lot fifty feet or less in width where there is a tenement-house on the front of the said lot, nor upon the front of any such lot uopn the rear of which there is such a tenement-house.

SECTION 29. Rooms, Lighting and Ventilation of. —

a. In every tenement-house hereafter erected every room except water-closet compartment and bathrooms shall have at least one window opening directly upon the street or upon a yard or court.

b. No court of a tenement-house hereafter erected shall be covered by a roof or skylight, but every such court shall be at every point open from the ground to the sky unobstructed, except as hereinafter otherwise provided, and shall conform to the requirements of the following sections; provided, that an apartment not containing any room fronting upon the street or yard shall have a fire-escape in a court, projecting not more than four feet from the wall of the house.

c. Where one side of an outer court is situated on the lot line, the width of the said court, measured from the lot line to the opposite wall of the building, for tenement-houses sixty feet in height shall not be less than six feet in any part; and for every twelve feet of increase or fraction thereof in height of the said building, such width shall be increased six inches throughout the entire height of said court; and for every twelve feet of decrease in the height of the said building below sixty feet, such width may be decreased six inches. Except that in tenement-houses hereafter erected not exceeding three stories and cellar in height and which also are not occupied or arranged to be occupied by more than six families in all, or by more than two families on any floor, and in which also each apartment extends through from the street to the yard, the width of an outer court situated on the lot line shall not be less than four feet in any part, provided that the length of such outer court does not exceed twenty-four feet. Where an outer court is situated between wings or parts of the same building, or between different buildings on the same lot, the width of the said court, measured from wall to wall, for tenement- houses sixty feet in height shall not be less than twelve feet in any part; and for every twelve feet of increase or fraction thereof in the height of the said building, such width shall be increased one foot throughout the entire height of the said court; and for every twelve feet of decrease in the height of the said building below sixty feet, such width of the said court may be decreased one foot. Except that in tenement-houses hereafter erected not exceeding three stories and cellar in height and which also are not occupied or arranged to be occupied by more than six families in all, or by more than two families on any floor, and in which also each apartment extends through from the street to the yard, the width of an outer court situated between wings or parts of the same building, or between different buildings on the same lot, measured from wall to wall, shall be not less than eight feet in any part, provided that the length of said outer court does not exceed twenty-four feet. Wherever an outer court changes its initial horizontal direction, or wherever any part of such court extends in a direction so as not to receive direct light from the street or yard, the length of such portion of said court shall never exceed the width of said portion; such length to be measured from the point at which the change of direction commences. Wherever an outer court is less in depth than the minimum width prescribed by this title, then its width may be equal to, but not less than its depth, provided that such width is never less than four feet in the clear. This exception shall also apply to each offset or recess in outer courts. And no window except windows of water-closet compartments, bath-rooms or halls shall open upon any offset or recess less than six feet in width.

d. Where one side of an inner court is situated on the lot line, the width of the said court measured from the lot line to the opposite wall of the building, for tenement-houses sixty feet in height, shall not be less than twelve feet in any part, and its other horizontal dimension shall not be less than twenty-four feet in any part; and for every twelve feet of increase or fraction thereof in the height of the said building, such width shall be increased six inches throughout the entire height of said court, and the other horizontal dimension shall be increased one foot throughout the entire height of said court; and for every twelve feet of decrease in the height of the said building below sixty feet, such width may be decreased six inches and the other horizontal dimension may be decreased one foot. Except that in tenement-houses hereafter erected not exceeding three stories and cellar in height and which also are not occupied or arranged to be occupied by more than six families in all, or by more than two families on any floor, and in which also each apartment extends through from the street to the yard, the width of an inner court situated on the lot line measured from the lot line to the opposite wall of the building shall not be less than eight feet in any part, and its other horizontal dimension shall not be less than fourteen feet in any part. Where an inner court is not situated upon the lot line, but is inclosed on all four sides, the least horizontal dimension of the said court, for tenement-houses sixty feet in height, shall not be less than twenty-four feet; and for every twelve feet of increase or fraction thereof in the height of the said building, the said court shall be increased one foot in each horizontal dimension, throughout the entire height of said court; and for every twelve feet of decrease in the height of the said building below sixty feet, the horizontal dimensions of the said court may be decreased one foot in each direction. Except that in tenement-houses hereafter erected not exceeding three stories and cellar in height and which also are not occupied or arranged to be occupied by more than six families in all, or by more than two families on any floor, and in which also each apartment extends through from the street to the yard, the least horizontal dimension of an inner court not situated on the lot line, but inclosed on all four sides, shall not be less than fourteen feet. Offsets or recesses in inner courts will be permitted, but where the depth of such offset or recess is less than the minimum width prescribed, then the width of said offset or recess may be equal to but not less than its depth, provided that such width is never less than four feet in the clear. And no window except windows of water-closet compartments, bathrooms, or halls shall open upon any offset or recess less than six feet in width. Every inner court shall be provided with one or more horizontal intakes or ducts at the bottom. Said intake or duct shall be not less in total area than four per centum of the area of said inner court. Each such intake or duct shall be at least five square feet in area, and shall always communicate directly with the street or yard. Whenever the said intakes or ducts consist of a passageway or passageways, such passageway shall be left open, or if not open, there shall always be provided in said passageway or passageways open grilles or transoms of a size not less than five square feet each, and such open grilles or transoms shall never be covered over by glass or in any other way. There shall be at least two such grilles or transoms in each such passageway, one at the inner court and the other at the street or yard, as the case may be.

e. Nothing contained in the foregoing sections concerning outer and inner courts shall be construed as preventing windows at the angles of said courts, provided that the running length of the wall containing such windows does not exceed six feet. Except that in outer or inner courts of a less size than the minimum prescribed for tenement-houses sixty feet in height, the running length of the wall containing windows in the angles of said court shall not exceed four feet. In construing said sections the height of the building is to be measured from the curb level to the top of the highest wall inclosing or forming such court. When a tenement-house hereafter erected has no basement and the cellar ceiling is not more than two feet above the curb level, the courts mentioned in the seven preceding sections may start at the level of the second tier of beams. This provision, however, shall not be construed so as to permit any room without a window opening on the street or yard or on a court in every part the dimensions prescribed in the foregoing sections. Where a court starts at the level of the second tier of beams in whole or in part, and the bottom of said court is a skylight over a store or hall, proper access to the top of said skylight shall be provided, and said skylight shall be so arranged as to be easily cleaned.

SECTION 30. Windows in Rooms. — In every tenement-house hereafter erected the total window area in each room except water-closet compartments and bathrooms shall be at least one-tenth of the superficial area of the room, and the top at least of one window shall be not less than seven feet six inches above the floor, and the upper half of it shall be made so as to open the full width. No such window shall be less than twelve square feet in area between the stop beads.

SECTION 31. **Windows in Water-closet Compartments and Bathrooms.** — In every tenement-house hereafter erected the total window area in a water-closet compartment or bathroom shall not be less than three square feet in area for each, and no such window shall be less than one foot in width, measured between stop beads.

SECTION 32. **Rooms, Size of.** — In every tenement-house hereafter erected all rooms except water-closet compartments and bathrooms shall be of the following minimum sizes: In each apartment there shall be at least one room containing not less than one hundred and twenty square feet of floor area, and each other room shall contain at least seventy square feet of floor area. Each room shall be in every part not less than nine feet high from the finished floor to the finished ceiling; provided, that an attic room need be nine feet high in but one-half its area. The floor of the cellar or lowest floor of every tenement-house shall be water tight. And the cellar ceiling shall be plastered, except where the first floor above the cellar is constructed of iron beams and fireproof filling.

SECTION 33. **Alcoves.** — Alcove-rooms must conform to all the requirements of other rooms.

SECTION 34. **Public Halls.** — In every tenement-house hereafter erected, exceeding three stories and cellar in height, every public hall shall have at least one window opening directly upon the street or upon a yard or court, when ordered by the commissioner. Either such window shall be at the end of said hall, with the plane of the window at right angles to the axis of said hall, or there shall be at least one window opening directly upon the street or upon a yard or court in every twenty feet in length or fraction thereof of said hall; but this provision for one window in every twenty feet of hallway shall not apply to that portion of the entrance hall between the entrance and the first flight of stairs, provided that the entrance door contains not less than five square feet of glazed surface. In every public hall in a tenement-house hereafter erected recesses or returns the length of which does not exceed twice their width will be permitted without an additional window. But wherever the length of such recess or return exceeds twice its width the above provisions in reference to one window in every twenty feet of hallway shall be applied. Any part of a hall which is shut off from any other part of said hall by a door or doors shall be deemed a separate hall within the meaning of this section. In every tenement-house hereafter erected not exceeding three stories and cellar in height where the public hall is not provided with a window opening directly to the outer air, sash doors admitting light to the public halls from the apartments shall be provided where possible.

SECTION 35. **Windows for Public Halls, Size of.** — In every tenement-house hereafter erected one at least of the windows provided to light each public hall or part thereof shall be at least two feet six inches wide and five feet high, measured between stop beads.

SECTION 36. Privacy. — In every apartment of three or more rooms in a tenement-house hereafter erected, access to every living-room and bedroom and to at least one water-closet compartment shall be had without passing through any bedroom.

SECTION 37. Skylights. — In every tenement-house there shall be in the roof, directly over each stair well, a ventilating skylight with both ridge ventilators and fixed louvres, the glazed surface thereof to be not less than twenty feet square in area.

SECTION 38. Chimneys of Fireplaces. — In every tenement-house there shall be adequate chimneys running through every floor with an open fireplace or grate, or place for a stove, properly connected with one of said chimneys for every apartment.

SECTION 39. Vent Shafts. — Every vent shaft hereafter constructed in a tenement-house shall be at least twenty square feet in area, and the least dimension of such shaft shall not be less than four feet; and if the building be above sixty feet in height such shaft shall throughout its entire height be increased in area three square feet for each additional twelve feet of height or fraction thereof; and for each twelve feet of height less than sixty feet such shaft may be decreased in area three square feet. A vent shaft may be inclosed on all four sides, but shall not be roofed or covered over in any way. Every such shaft shall be provided with a horizontal intake or duct at the bottom, communicating with the street or yard or with a court; such duct or intake to be not less than one and one-half square feet in total area.

SECTION 40. Basement and Cellars. — In tenement-houses hereafter erected no room in the cellar or in the basement shall be constructed, altered, converted or occupied for living purposes, unless all of the following conditions are complied with:

a. Such rooms shall be at least nine feet high in every part from the floor to the ceiling. Provided, that in buildings already erected and not now used as tenement-houses but hereafter altered or converted to such use, such room shall be not less than seven feet high in every part.

b. The ceiling of such room shall be at least four feet and six inches above the surface of the street or ground outside of or adjoining the same.

c. There shall be appurtenant to such room the use of a separate water-closet, constructed and arranged as required by Section 44 of this article.

d. Such room shall have a window or windows opening upon the street, or upon a yard or court. The total area of windows in such room shall be at least one-eighth of the superficial area of the room, and one-half of the sash shall be made to open the full width, and the top of each window shall be within six inches of the ceiling.

SECTION 41. Every building hereafter built or altered to be used as a tenement-house for one family or more above the first story, shall have on at least two exposures on land of the owner, or as part of public ways, open spaces of at least ten feet in width measured from the main walls of the house. This space may be of a different dimension if an equivalent area for light and air is provided with the consent of the building commissioner.

SECTION 42. Every tenement-house hereafter erected shall have all walls below the ground level and all cellar or lower floors damp-proof and water-proof. When necessary to make such walls and floors damp-proof and water-proof, the damp-proofing and water-proofing shall run through the walls and up the same as high as the ground level and shall be continued throughout the floor, and the said cellar or lowest floor shall be properly constructed so as to prevent dampness or water from entering. There shall be no family except janitor's living in basement of tenement-houses except by special permit of Board of Health.

SECTION 43. Shafts, Courts, Areas and Yards.— In every tenement-house hereafter erected the bottom of all shafts, courts, areas and yards which extend to the basement for light or ventilation of living-rooms, must be six inches below the floor level of the part occupied or intended to be occupied. All shafts, courts, areas and yards shall be properly concreted, graded and drained, and shall be properly connected with the street sewer so that all water may pass freely into it.

SECTION 44. Water-closet Accommodations. — In every tenement-house hereafter erected there shall be a separate water-closet in a separate compartment within each apartment, provided that where there are apartments consisting of but one or two rooms, there shall be at least one water-closet for every three rooms. All water-closet compartments must have a window opening upon the street or yard or upon a court or vent shaft. Every water-closet compartment shall be provided with proper means of lighting the same at night. If fixtures for gas or electricity are not provided in said compartment, then the door of said compartment shall be provided with ground glass or wire glass panels or with a ground glass or wire glass transom, not less in area than four square feet. The floor of every water-closet compartment, if so ordered by the commissioner, shall be made water-proof with asphalt, tile, stone, metal or some other water-proof material; and such water-proofing shall extend at least six inches above the floor so that the said floor can be washed or flushed out without leaking. No drip trays shall be permitted. No water-closet fixtures shall be inclosed with any woodwork.

SECTION 45. Plumbing. — In every tenement-house hereafter erected, all plumbing pipes shall wherever possible be exposed. In all tenement-houses hereafter erected where plumbing or other pipes pass through floors or partitions, the openings around such pipes shall be sealed or made air tight, with plaster or other incombustible materials, so as to prevent the passage of air or the spread of fire from one floor to another or from room to room.

SECTION 46. Basements and Cellars, continued. — Hereafter in any now existing tenement-house no room in the basement or cellar shall be occupied for living purposes without a written permit from the Building Department, and such permit shall be kept readily accessible in said room. And no such room shall hereafter be occupied unless all the following conditions are complied with. The said written permit shall be issued when all of the said conditions are complied with. If refused, the reasons for such refusal shall be stated by said department in writing, and a copy thereof shall be kept in a proper book in the office of said department, and be accessible to the public.

a. Such room shall be at least seven feet high in every part from the floor to the ceiling.

b. The ceiling of such room shall be in every part at least two feet above the surface of the street or ground outside of or adjoining the same.

c. There shall be appurtenant to such room the use of a water-closet.

d. There shall be outside of and adjoining such room and extending along the entire frontage thereof, an open space of at least two feet six inches wide in every part, unless such room extends for more than one-half of its height above the curb level. Such space shall be well and effectually drained.

e. Such room shall have a window or windows opening to the outer air of at least nine square feet in size clear of the sash frame, and at least four and one-half square feet of which shall have been made to readily open for purposes of ventilation.

f. If the house is situated over marshy ground, or ground on which water lies, or ground on which there is water pressure from below, the lowest floor shall have been made water-proof and damp-proof.

g. Such room shall have sufficient light, shall be well drained and dry, and shall be fit for human habitation.

SECTION 47. Cellar Walls and Ceilings. — The cellar walls and ceilings of every tenement-house shall be thoroughly whitewashed or painted a light color by the owner at least once a year; and no tenement-house hereafter erected, whether or not it has now been actually commenced, shall be occupied until this has been done for the first time.

SECTION 48. Roofs. — The roof of every tenement-house shall be kept in good repair and so as not to leak, and all rain water shall be so drained and conveyed therefrom as to prevent its dripping on to the ground or causing dampness in the walls, ceilings, yards or areas.

SECTION 49. Water Supply. — Every tenement-house shall have a proper sink with running water furnished in sufficient quantity at one or more places on each floor. The owner shall provide proper and suitable tanks, pumps, or other appliances to receive and to distribute an adequate and sufficient supply of such water at each floor in the said house, at all times of the year, during all hours of the day and night. But a failure in the general supply of water by the town authorities shall not be construed to be a failure on the part of such owner, provided that proper and suitable appliances to receive and distribute such water have been provided in said house.

SECTION 50. Shafts and Courts. — In every tenement-house there shall be, at the bottom of every shaft and inner court, a self-closing fireproof door giving sufficient access to such shaft or court to enable it to be properly cleaned out. Provided, that where there is already a window in a now existing tenement-house, giving proper access to such shaft or court, such window shall be deemed sufficient.

SECTION 51. Certificate of Compliance. — No building hereafter constructed as or altered into a tenement-house shall be occupied in whole or in part for human habitation until the issuance of a certificate by the Building Department that said building conforms in all respects to the requirements of this law. Such certificate shall be issued within ten days after written application therefor, if said building at the date of such application shall be entitled thereto.

SECTION 52. Depositories for ashes in the interior of any building shall be made of incombustible material.

ARTICLE XVIII.

RESTRICTIONS NOT OTHERWISE PROVIDED FOR, RELATING TO THE ERECTION, ALTERATION, HEIGHT, OCCUPANCY AND USE OF BUILDINGS.

SECTION 1. The height of any building or other structure, hereafter erected, shall not be more than two and one-half times the width of the widest street upon which it stands, but in no case shall it exceed one hundred and twenty-five feet.

SECTION 2. Every building hereafter erected which is used above the first floor as a warehouse or store for the storage or sale of merchandise shall not exceed one hundred feet in height, and shall be divided by brick partition walls of the thickness prescribed for bearing partition walls, and carried thirty inches above the roof, so that no space inside any such building shall exceed in area ten thousand square feet.

SECTION 3. Every building of the second class hereafter built shall be divided by brick partition walls of the thickness prescribed for bearing partition walls and carried thirty inches above the roof, so that no space inside any such building shall exceed in area eight thousand square feet, and no existing wall in any second-class building shall be removed so as to leave an area of more than eight thousand square feet not so enclosed; provided, that in buildings having a height of not over forty-five feet the height above the roof of the said brick partition walls need not exceed twelve inches; and provided, also, that the provisions of this section shall not apply to buildings used only for working in non-combustible materials, and conforming to the requirements of first-class buildings except in having the beams of wood, supported or not supported by posts of wood, and in having floors of wood laid directly upon the beams and the floors kept uncovered on their underside between the beams, and having the roof built as approved by the commissioner.

SECTION 4. Every wooden building more than twenty-five feet in height and twenty-five hundred feet in horizontal area, to be used for any purpose other than that of a dwelling-house, shall unless otherwise ordered by the Building Commissioner have for every such area an intercepting brick wall not less than twelve inches thick, carried twelve inches above the roof and covered with metallic covering.

SECTION 5. Every building hereafter erected or altered to be used as a hotel, lodging-house, theatre, jail, police station, hospital, asylum or institution for the care or treatment of persons, the height of which exceeds thirty-five feet to the ceiling of the upper story, and every other building hereafter erected, altered or raised to over seventy feet in height shall be a first-class building; excepting, however, as is provided for in Section 20 of this article, and excepting also all buildings for which specifications and plans have been heretofore submitted to and approved by the Building Department.

SECTION 6. Every wooden building hereafter erected or altered, except as provided in Section 20 of this article, shall be not more than forty-five feet in height; but wooden spires for churches may be seventy feet in height.

SECTION 7. No third-class building, hereafter built or altered on any street, way or place of a width of less than forty feet, shall have a height of more than twice the distance from its front line to the middle line of the street, way or place on which it is located, but bay-windows, projections and other parts of the building may project not more than two and one-half feet but not over the lot line.

SECTION 8. Openings or doorways in party walls or in partition walls required by this law shall not exceed two in number for each floor, and the combined area of such openings on each floor shall not exceed one hundred square feet. Each opening must be provided with two sets of metal-covered doors separated by the thickness of wall, hung to rabbeted iron frames, or to iron hinges in brick or iron rabbets; provided, that this section does not apply to theatres.

SECTION 9. Every second-class and third-class building hereafter built, except as hereinafter provided, shall have a sufficient fire-stop at each floor, covering the whole floor of each story through all stud partitions, and extending to the masonry walls or outside boardings. Every air duct, except those expressly sanctioned by this law, shall be effectually stopped at each story. Every such fire-stop shall consist of such fire-resisting material of low heat conductivity as may be approved by the Building Department; provided, that all second-class buildings hereafter erected, of forty-five feet or more in height, which are used above the first floor as storage stores, warehouses or stores for the storage and sale of merchandise, shall have a tight splined or tongued and grooved under-floor of at least two-inch plank, with an upper floor one inch thick, matched and breaking joints, and in such buildings fire-stops need not be used. Every second-class building shall also have fire-stops put in in a manner satisfactory to the building commissioner, made of incombustible material placed at every floor between the studding of all main and staircase partitions from top of partition cap to six inches above the floor, and around all chimneys and wherever the said commissioner may designate. Every wooden building used as a stable, carpenter-shop, or other similar shop, shall be exempt from the provisions of this section. Every wooden building to be used solely for mercantile, manufacturing or storage purposes may have floors made of boards at least one inch thick, matched and breaking joints, laid upon a tight splined or tongued and grooved under-floor of plank at least two inches thick with the space between the supporting timbers of the floor open and uncovered, and without any fire-stop. The spaces between stringers of staircases and joists of landings, unless unceiled, shall be fire stopped with some of the incombustibles hereinbefore mentioned, at three places at least in every flight of stairs, as to prevent the passage of air.

Where masonry walls are studded-off, the space between the inside face of the wall and the studding shall be fire-stopped with fireproof material placed on the under side of the wood beams above, for a depth of not less than four inches, and be securely supported; or the beams directly over the studded-off space shall be deafened with not less than four inches of fireproof material, which may be laid on boards cut in between the beams.

SECTION 10. Wainscoting. — When wainscoting is used, in any building hereafter erected or altered, except in a third-class building, the surface of the wall or partition behind such wainscoting shall be plastered flush with the grounds and down to the floor line.

SECTION 11. Numbering of Buildings. — No person shall neglect or refuse to affix to any building owned by him the street number designated for such building by the town engineer, nor shall any person affix to or suffer to remain on any building owned or occupied by him a street number other than the one designated for such building by said engineer.

SECTION 12. Sky Signs. — Signs of wood shall not be erected over two feet high on any building. Sky signs, or any device in the nature of an advertisement, announcement, or direction, supported upon or above or attached to any building, constructed of sheet metal or wire fastened to wood frames, shall be deemed to be wood signs. Before any wood or metal sign shall be placed in position upon, above or attached to the outside of any building, a permit shall first be obtained from the commissioner. Such sign shall be so constructed, placed and supported as not to be or become dangerous. All signs which shall be dangerous in any manner whatever shall be repaired and made safe or taken down by the owner, lessee or occupant of the building. No signs or bill-boards of wood or metal erected upon uprights or other supports extending into the ground shall be at any point more than ten feet above the surface of the ground, and the same shall be properly supported and braced.

SECTION 13. Water-tables, window-caps and sills may project into or over any public street, way or square not more than one inch, and cornices may project not more than five per cent. of the width of the street, way or square which it overhangs, if such street, way or square is not less than forty feet wide, or three per cent. if such street, way or square is less than forty feet wide, but in no case shall any cornice project more than three feet over any public street, way or square. The method of construction shall be such as the commissioner shall approve.

SECTION 14. No bay-window or other structure, except cornices, water-tables, window-caps and sills, and fire-escapes, shall be placed upon any building so as to project into or over any public street, way or square without the permission of the Board of Selectmen given after due notice and hearing, and the method of construction shall be such as the commissioner shall approve; but in no case shall any bay-window be projected for more than three feet over any public street, way or square.

SECTION 15. No building of which any part is used for storage or sale of hay, straw, hemp, flax, shavings, burning fluid, camphene or other highly combustible substance, except kerosene and other products of petroleum, shall be occupied in any part as a dwelling, tenement or lodging-house, except that rooms for coachmen or grooms may be allowed in private stables authorized by this law, upon special permit from the commissioner.

SECTION 16. Every lodging-house containing more than fifty rooms above the first floor, and every tenement-house containing more than fifty sleeping-rooms above the first floor, shall have at least one night watchman exclusively so employed on duty every night from nine o'clock at night until six o'clock in the morning; and every lodging-house of the second class containing more than one hundred rooms above the first floor, and every tenement-house containing more than one hundred sleeping-rooms above the first floor shall have at least two night watchmen exclusively so employed on duty every night from nine o'clock at night until six o'clock in the morning. But in the latter class of lodging and tenement-houses, a proper system of thermostats, or automatic fire-alarms, approved in writing by the building commissioner, may be substituted for one of the watchmen. In all lodging or tenement-houses of either of the above classes a red light shall be kept burning at night at the head and foot of every flight of stairs, and one or more gongs shall be so placed, and be of such size and number as to give the alarm throughout the house in case of fire; and in every sleeping-room there shall be conspicuously posted directions for escape in case of fire. The building commissioner may make such other or further requirements for prevention of and escape from fire as may be reasonably necessary under the conditions of each case. Any innholder who fails to comply with the provisions of this section shall thereby forfeit his license.

SECTION 17. Every lodging-house, every schoolhouse, and every building where operatives are employed, shall have at least one water-closet or privy, and at least one water-closet or privy for every twenty persons therein living. attending or employed; and in buildings where operatives of both sexes are employed, separate accommodations shall be furnished for men and women. Privies or cesspools shall not be allowed where a sewer makes water-closets practicable.

SECTION 18. All school buildings shall have fire walls of incombustible material satisfactory to the building commissioner, and where said commissioner shall designate. Two at least of the stairways shall be inclosed on three sides with fireproof partitions. In school buildings of second-class construction the walls on three sides of stairways shall be of brick twelve inches thick, and two at least of the stairways shall be of fireproof construction. Every building hereafter erected or altered to be used as a hotel or lodging-house, not more than three stories, or thirty-five feet to the ceiling of the upper story, in height, containing more than fifteen sleeping-rooms above the basement or cellar, shall be a second-class building, and plastered on metal lathing or other fireproof material throughout, and have a sufficient number of stairs and fire walls all to the satisfaction of the commissioner.

SECTION 19. All buildings hereafter built or altered over, for the purpose of utilizing a part of same for living purposes, and a part for business or manufacturing purposes, shall be so built or altered so that such portion intended to be utilized for business or manufacturing shall be separated entirely from the portion intended for living purposes by such fire-proof material as may be acceptable to the building commissioner.

SECTION 20. No permit for the erection of a spire exceeding seventy feet in height for a church, nor for the erection, location and height of any elevator for storage or sale of grain or coal, shall be given except on approval of the Board of Selectmen.

SECTION 21. An apartment-house of not more than three stories in height to contain not more than six apartments may be a building of the second class if the following additional conditions are complied with, viz.:—

a. To have not more than two apartments in one story.

b. Each apartment to be completely separated from the other apartment in same story by a brick wall not less than twelve inches thick carried through the roof as specified in Section 14, Article VI.

c. The ceilings and walls of all hallways and stairways for use in common by more than three of said apartments shall be of masonry or plastered on metal laths in manner satisfactory to the commissioner, and all such hallways and stairways shall be enclosed in brick walls not less than twelve inches thick carried through the roof as specified in Section 14, Article VI., and the doors leading from such hallways and stairways to the apartments shall be fireproof with soft wood cores, such doors to be hung as specified in Section 3, Article XIII.

d. The floor of the front entrance hall up to and including the stair enclosure in the first story shall be of fireproof construction.

e. The front entrance hall up to the stair enclosure shall be at least eight feet wide in the clear, and each of the front stair halls, stairways and landings and the least horizontal dimension of the space enclosed by the stairways and its landings shall be at least four feet.

An apartment-house of not more than two stories in height with not more than two apartments on the second floor may be a building of the second class if the following additional conditions are complied with, viz.:—

a. The apartments on the same story are to be completely separated from each other by fire retardent partitions, of such construction as may be approved by the commissioner.

b. All entrance halls and stairways to be at least three feet six inches wide in the clear from the street entrance to the second floor, the same to be plastered throughout on incombustible material satisfactory to the commissioner.

SECTION 22. An apartment-house of not more than four stories in height to contain not more than eight apartments may be a building of the second class if the following additional conditions are complied with, viz.: —

a. To have not more than two apartments in one story.

b. Each apartment to be completely separated from the other apartment in same story by a brick wall not less than twelve inches thick carried through the roof as specified in Section 14, Article VI.

c. The entire building shall be plastered on incombustible materials from wall to wall and from floor to ceiling in each story. All hallways and stairways which are used in common by more than four families shall be enclosed in brick walls not less than twelve inches thick carried through the roof as specified in Section 14, Article VI., and the doors leading from such hallways and stairways to the apartments shall be fire-proof with soft wood cores, hung as specified in Section 8, Article XIII.

d. The floor of the front entrance hall up to and including the stair enclosure in first story and the front and rear stair halls, stairways and landings, which are used in common by more than four families shall be of fire-proof construction.

e. The front entrance hall up to the stair enclosure shall be at least ten feet wide in the clear, the stair-halls, stairways and landings and the least horizontal dimension of the space enclosed by the stairway and its landings, shall be as follows, to wit: — for the front stair-halls, stairways and landings not less than four feet, and for the rear stair-halls, stairways and landings, not less than forty inches.

SECTION 23. No building shall be lathed until the commissioner has been notified in writing that such building is ready and until he has given written consent thereto.

ARTICLE XIX.

WOODEN BUILDINGS.

SECTION 1. Every wooden building hereafter erected or altered, the sills of which do not rest directly upon a foundation as hereinbefore described, but on an underpinning, shall have such underpinning made of brick or stone; and if the building is thirty-three feet or less in height above the highest street level of its principal front, the underpinning, if of brick, shall be at least eight inches thick, and if the building is of greater height, the underpinning, if of brick, shall be at least twelve inches thick; every underpinning of stone shall be at least sixteen inches thick.

SECTION 2. Every wooden building hereafter erected or altered shall have all parts of sufficient strength to carry the weight of the superstructure; shall be built with sills, posts, girts, studs and plates, properly framed, mortised, tenoned, braced and pinned in each story; the posts and girts shall be not less than four by eight inches in cross section, and the studs shall be not more than twenty inches apart, and no ledger board shall be used in any structure.

SECTION 3. Any external wall of any wooden building hereafter erected or altered to be used as a dwelling-house, unless made of brick at least twelve inches thick carried twelve inches above the roof and covered with a metallic covering, or with the roof laid and embedded in mortar on such wall, shall not be nearer than three feet to the line of any adjoining lot, nor nearer than six feet to any other wooden building erected or altered after this law goes into effect.

SECTION 4. Every wooden building hereafter erected to be a block of two or more dwelling-houses shall have a brick party wall between every two houses not less than twelve inches thick, carried twelve inches above the roof if flat and covered with a metallic covering.

SECTION 5. Any external wall of any wooden building hereafter erected or altered to be used for any purpose other than a dwelling-house, unless made of brick at least twelve inches thick carried twelve inches above the roof and covered with a metallic covering, or with the roof laid and embedded in mortar on such wall, shall not be nearer than five feet to the line of any adjoining lot nor nearer than six feet to any other building; but in no case, excepting by special vote of the Board of Health, shall a wooden building to be used as a stable be built or placed nearer than ten feet to the line of any adjoining lot or to a wall of any other building.

SECTION 6. No four inch brick veneering shall be allowed on any wooden building hereafter erected or altered; excepting that it may be allowed on detached private dwellings not over two and one-half stories in height, of a construction approved in writing by the commissioner.

ARTICLE XX.

PLUMBING.

SECTION 1. All plumbers shall qualify as provided by Chapter 103 of the revised laws of the Commonwealth of Massachusetts; and the commissioner shall be immediately notified of any change of partnership or business address. All master plumbers shall have a bona fide place of business and their license shall be conspicuously displayed therein. No person shall do or carry on the business of plumbing in this town unless he shall first have registered his name and place of business in the office of the building commissioner, and have been duly licensed so to do; and notice of any change in the place of business of a registered plumber shall be immediately given to said commissioner.

SECTION 2. Every plumber, before doing any work in a building, shall, except in the case of the repair of leaks, file at the office of the Building Commissioner, upon blanks to be provided for the purpose, a notice of the work to be performed; and no such work shall be done in any building except in accordance with plans which shall be approved by the Inspector of Plumbing and a permit issued therefor.

SECTION 3. Every building in the town of Brookline used as a dwelling, tenement or lodging-house, or where persons are employed, shall be separately and independently connected with the public sewer, when such sewer is provided, or, subject to the approval of the town engineer, the drain from such building may be connected outside thereof, with a proper and sufficient drain which connects with a public sewer. If no sewer is accessible, a proper cesspool shall be provided as directed by the Board of Health.

SECTION 4. No drain or sewer pipe from any building shall pass through or under another building without the approval of the plumbing inspector, nor shall any drain or sewer pipe from any building pass through or under another building or within ten feet of the foundation walls thereof, unless it be of extra heavy cast iron pipe.

SECTION 5. Pipes and other fixtures shall not be covered or concealed from view until approved by an Inspector of Plumbing, who shall examine the same within two working days after notice that they are ready for inspection. All connections with iron drains, soil, waste, vent and conductor pipes shall be made before inspection.

SECTION 6. Plumbing work shall not be used unless the same has first been tested by the plumber, in the presence of an Inspector of Plumbing, with the water test, and if that is not practicable, with the peppermint or other reliable test, and approved by the said inspector. Drain pipes, conductors and waste pipes shall be of sufficient size and made of cast iron, or iron size brass within the building and for a distance of at least ten feet outside. except that lead pipe or plumber's brass tubing may be used for short connections exposed to view. Such pipes, if of cast iron, shall be of uniform thickness throughout, free from all defects, and shall have an average weight not less than that below specified, viz:

2	-inch pipe,	5½	lbs	per foot.
3	"	9½	"	"
4	"	13	"	"
5	"	17	"	"
6	"	20	"	"
8	"	33½	"	"
10	"	45	"	"
12	"	54	"	"

Section 7. Drain pipes shall be properly secured by irons to walls, laid to uniform grade on substantial brick piers, resting on solid foundations or suspended to floor timbers by strong iron hangers. They shall be supplied with a suitable running trap, placed with an accessible heavy brass clean-out, either outside or inside the foundation wall of the building. Fresh-air inlet pipe, if used, shall be not less than four inches in diameter, entering the drain on the house side of the trap, and as near the said trap as possible. Drain pipes shall be run as direct as possible, and shall have a fall of not less than one-fourth of an inch to the foot towards the drain or sewer, and shall be carried out through the roof open and undiminished in size, and to a sufficient height, not less than two feet above the roof and not less than five feet above the top of any window within fifteen feet of the pipe. Changes in direction shall be made with curved fittings, and connections with horizontal and vertical pipes shall be made with full Y branches; except that T's may be used for vent pipes and Tee Y's on vertical lines for branch connections for water-closets that require a lead bend below the floor. All drain pipes shall be exposed to sight where practicable within the building, and shall not be exposed to pressure where they pass through walls.

Section 8. From a point ten feet outside the building to the sewer or cesspool the drain may be of extra heavy cast iron soil pipe or best quality vitrified drain pipe.

Section 9. No trap or quarter-bend shall be placed at the foot of a vertical soil or drain pipe. No saddle hubs will be allowed on any plumbing. No couplings shall be used in connections with traps, drain, soil, waste or air pipes on the outer side of traps, unless such couplings are "brass unions" having air-tight ground joints. All traps, except the main running trap, shall have their screws below the water line or on the fixture or inner side of trap.

Section 10. All handholes or openings in iron traps, drain, soil, waste, vent or conductor pipes for cleaning or inspection purposes shall be closed with extra heavy brass trap screw ferrules properly leaded and caulked into the iron hubs. Except that cast iron tapped T's having heavy brass screw caps or brass plugs, may be used for running clean-outs.

Section 11. No rain-water conductor shall be connected with the house drain or sewer, except by permission of the Board of Health or its agents. No rain-water conductor shall be used as a soil, waste or vent pipe, nor be connected therewith, nor shall any soil, waste or vent pipe be used as a rain-water conductor. When connected with the house drain, rain-water conductors shall be properly trapped.

SECTION 12. Sewer, soil pipe or waste pipe ventilators shall not be constructed of brick, sheet metal or earthenware, and chimney flues shall not be used for such ventilation.

SECTION 13. Joints on cast iron pipes shall be made with oakum, and run full with soft molten lead, well caulked and left clean without paint or cement of any kind until after inspection. Joints on wrought iron or brass, or between cast iron and wrought iron pipes, to be made with screw threads. Connections of lead pipes with cast iron pipes shall be made by heavy brass sleeves soldered to the lead with full-sized wiped joints and properly caulked to the iron; to wrought iron and brass, joined to the lead in same manner, and connected to brass or wrought iron with brass screw nipples. Joints on lead waste and vent pipes shall on the sewer or outer side of traps be full-sized wiped joints in all cases.

SECTION 14. Every sink, basin, bath-tub, slop-hopper, water-closet, and each set of wash-trays, and every fixture having a waste pipe shall be furnished with a separate trap, which shall be placed as near as practicable to the fixture that it serves; except that where a sink and set of trays or a basin and bath-tub are close together, and the waste pipe does not exceed three feet in length from its connection with the fixture to its connection with the trap, then one five-inch round trap placed between the fixtures may be used for both.

SECTION 15. Each and every trap shall be protected from siphonage or air pressure by extra heavy cast iron, or standard galvanized wrought iron special air pipes of a size not less than two inches internal diameter, to be run from the crown of the trap, except that one and one-half inch galvanized wrought iron pipe may be used for "back vents" for single fixtures for a distance not greater than twenty feet. Lead pipe and plumber's brass tubing of a size not less than the waste pipe from the trap may be used for short connections only where exposed to view. Air pipes from water-closet traps shall be of two-inch bore, if thirty feet or less in length, and of three-inch bore if more than thirty feet in length. Not more than three water-closet traps shall be back-aired into the same pipe if less than three inches in diameter. This section shall not apply to traps having waste pipes not more than three feet in length between them and a line of four-inch "vent pipe" extended full size through the roof to the open air, provided such traps have an independent connection with the soil pipe, and that no running water enters the stack from the stories above; it is further provided that a trap that is specially difficult to siphon and which shall be approved by the inspector of plumbing, shall be used in such work.

SECTION 16. All air pipes shall be run as direct as practicable, and shall be of not less than four inches bore where they pass through the roof, and shall not be covered by a cowl or cap. Two or more air pipes may be connected together or with a drain pipe, but in every case of connection with a drain pipe such connection shall be above the upper fixture of the building. Air pipes shall be so constructed as not to allow the formation of a trap, nor be used as waste pipes.

SECTION 17. Bow venting will not be allowed except by special permission of the building commissioner.

SECTION 18. The preceding sections shall not be enforced to require the application of separate air pipes to each trap in buildings constructed prior to the passage of this by-law, when old fixtures are replaced by new ones, in case of traps attached to bath-tubs, lavatory-basins, sinks and wash-trays, provided some style of trap be used more secure against siphonage than ordinary S traps, and provided the branch wastes into which such traps deliver are not over three feet in length between such traps and the main soil pipe or drain, and provided also that such main soil pipe extends to the open air through the roof, of full size.

SECTION 19. Drip or overflow pipes from safes under water-closets and other fixtures, or from tanks or cisterns, shall be run to some place in open sight; and in no case shall any such pipe be connected directly with a drain, waste pipe or soil pipe.

SECTION 20. Waste pipes from refrigerators or other receptacles in which provisions are stored shall not be connected with a drain, soil pipe or other waste pipes, unless such waste pipes are provided with traps, suitably ventilated, and in every case there shall be an open tray between the trap and the refrigerator. In tenement or apartment-houses, vertical lines of refrigerator wastes discharging into open-air sinks or trays, or dry wells, or other receptacles, shall have a diameter of at least two inches and shall extend through the roof for ventilation.

SECTION 21. Every water-closet or line of water-closets on the same floor, shall be supplied with water from a tank or cistern, and the flushing pipe shall not be less than one and one-quarter inches in diameter; but this requirement shall not apply to water-closets substituted for vaults where the same are located outside of the building proper, and such water-closets may be arranged so as to receive their supply directly from the main, with such fixtures as shall be approved by the Water Board and the Board of Health. No water-closet shall be placed in any room or apartment in any building that has not sufficient light and direct communication with the external air, either by a window or air shaft, having an area to the open air of at least three square feet. Earthenware or other water-closets having traps above the floor and requiring a lead-bend connection shall have a cast brass flange soldered on to the bend and bolted to the flange of closet with a suitable packing between to insure a permanent and gas-tight joint.

SECTION 22. Soil pipes from water-closets shall not be of less than four inches internal diameter. Waste pipes from the traps of fixtures such as sinks, basins, baths or wash-trays shall be of two-inch cast iron, and may have short connections of lead beneath floors, and where exposed to view. Such connections shall not be of less than one and one-quarter inch bore, and must not be branched into each other, but shall be separately connected with the iron pipe.

SECTION 23. Waste pipes from the traps or sinks or wash-trays shall not be connected with the bends or traps of water-closets, but the waste pipe from *one* trap which serves for a bath-tub or basin may be connected with a lead bend fixed below any floor for water-closet connections, and no other waste pipe will be allowed to enter or connect with such bends.

SECTION 24. No steam-exhaust, blow-off nor drip pipe shall connect with a sewer, house drain, rain-water conductor, soil, waste or vent pipe. Such pipes shall discharge into a suitable tank or condenser, from which a proper outlet to the house drain shall be provided. Any such tank or condenser shall have a vapor pipe of proper size, and the overflow from any such tank or condenser shall connect with drain outside the main wall of building.

SECTION 25. Every range, bath, or general hot-water boiler shall be provided with a steam-exhaust or expansion pipe carried up to, and above the tank which supplies water to said boiler, excepting when a direct pressure boiler is used. In this case the boiler shall be provided with an approved safety or water relief valve to prevent the liability of bursting.

SECTION 26. No person shall discharge any stall drainage, or any contents of any privy vault, manure pit or carriage wash into a public drain or sewer, except through an intervening catch-basin, the outlet pipe of which shall be high enough above the bottom to prevent any but liquid contents from passing over into the drain or sewer. A sufficient trap shall be placed in every drain connecting such catch-basin with a sewer.

SECTION 27. Vaults or privies shall not be allowed in premises that are accessible to the sewer without a special permit from the Board of Health.

SECTION 28. A grease trap shall be constructed for and connected with the sink of every hotel, eating-house, restaurant or other public cooking establishment, so as to be easily accessible for inspection and cleansing.

ARTICLE XXI.

SECTION 1. Building Department. — There shall be a department to be called the Building Department, which shall be furnished at the expense of the town with office room and such supplies for the transaction of its business as the town may provide.

SECTION 2. The Board of Selectmen shall annually in April appoint a Building Commissioner who shall also be the Inspector of Buildings, for the term of one year from the first day of May following, or until another is appointed in his stead. His salary or compensation shall be such as the town may from time to time vote. He shall be either an architect, builder or civil engineer of at least ten years' practice. The selectmen shall have power at any time to remove the building commissioner. The said commissioner, subject to the approval of the board of selectmen, shall have authority to appoint as employees of the building department such number of building inspectors, engineers, clerks, messengers, assistants and other subordinates as the work requires, and to remove the same or any of them, for cause. The inspectors shall be competent men, either architects, engineers, masons, carpenters, plumbers, or iron workers, who shall have served at least five years as such during the years next preceding the date of appointment, and who shall hold office until removed by the commissioner. All such inspectors shall before appointment be subjected to an examination before the civil service commission.

SECTION 3. It shall not be lawful for any officer or employee in the department to be engaged in conducting or carrying on business as an architect, civil engineer, carpenter, plumber, iron worker, mason or builder, or to be employed in any other business or be interested in any contract for building or for furnishing materials to be used for building.

SECTION 4. Appointment of Deputy. — The commissioner, subject to the approval of the Board of Selectmen, may designate in writing one of the building inspectors who, during the absence or inability of said commissioner, shall possess all the powers and perform all of the duties of said commissioner.

SECTION 5. Right to Enter Buildings. — Any member of a board of appeal and all of the officers of the Building Department, so far as may be necessary for the performance of their respective duties, may have the right to enter any building or upon any premises in said town, upon showing their badge of office.

SECTION 6. Duties of the Department. — The commissioner shall keep a record of the business of the department, and submit to the Board of Selectmen a yearly report of such business, and such other reports as they may call for.

SECTION 7. The commissioner or his assistants shall examine all buildings in the course of erection or alteration, as often as practicable, and make a record of all violations of this law, with the street and number of premises where such violations are found to exist, the name of the owner, architect, and master mechanic, and all other matters relative thereto.

SECTION 8. The building commissioner or his assistants shall examine all buildings reported dangerous or damaged by fire or accident, and make a record of such examinations, stating the nature and amount of such damage, the name of the street and number of the building, the names of the owner and occupant, and the purpose for which it is occupied, and in case of fire the probable origin thereof; shall examine all buildings for which applications have been made for permits to raise, enlarge, alter, build upon or tear down, and make a record of such examination. The records required by this section shall always be open to the inspection of the engineers of the fire department or any officer of the town, and of any other parties the value of whose property may be affected by the matters to which such records relate.

SECTION 9. The superintendent of streets shall issue a permit to any person authorized by the Board of Selectmen to place a coal-hole, vault, or coal-slide under a street, or a cover thereto; if a coal-slide, with the sides at least eight inches thick, of good hard brick, laid in cement; if other than a coal-slide, with the outer wall next to the roadway at least two and a half feet thick, of heavy granite blocks laid in cement, the side walls at least one foot thick, of good hard brick, or of granite blocks, laid in cement; the top of iron, or iron and glass, or of rough-surfaced iron, or, at least six inches thick, either of good hard brick laid in the form of an arch turned in a good and sufficient manner, or of rough-hammered granite, or bluestone, or North-river flagstone; shall make the opening of a coal-hole or coal-slide circular, and not more than eighteen inches in diameter, and furnish a cover therefor of iron, made with a rough upper surface, and with three or more iron rods or legs at least two feet in length, fitting closely to the side of the opening, and projecting downwards from the under side of the cover, and so constructed that, while the cover can be lifted perpendicularly, it cannot be tipped or easily removed from the opening.

SECTION 10. Said superintendent of streets shall, when authorized thereto by the Board of Selectmen, issue such a permit to a building-mover actually engaged in the business, for the purpose of moving a building through the streets, on a condition the terms of which shall be those stated in Section 2, Article II., of this law; provided, that an application for such permit, describing the locations from and to which, and the route over which, the building is to be moved, the length, width and height of the building, and the principal material of its exterior and roof, and accompanied by the written consent of the commissioner to the placing of the building on the lot proposed, shall be first made to said superintendent, who shall make an examination of the premises and report thereon to the Board of Selectmen for its action. Whenever it appears that the moving of the building will encumber the tracks of any railroad corporation, a public hearing shall be given by the Board of Selectmen upon the subject before such permit is authorized.

SECTION 11. Every owner of an estate hereafter maintaining any cellar, vault, coal-hole or other excavation under the part of the street adjacent to, or which is a part of, his estate, shall do so only on condition that such maintenance shall be considered as an agreement on his part to hold the town harmless from any claims for damage to himself or the occupants of said estate resulting from gas, sewage, or water leaking into such excavation or upon such estate; and every such owner, and every person maintaining a post, pole or other structure in a street, or a wire, pipe, conduit, or other structure under a street, shall do so only on the condition that such maintenance shall be considered as an agreement on his part with the town to keep the same and the covers thereof in good repair and condition, at all times during his ownership, and to indemnify and save harmless the town against any and all damages, costs, expenses or compensation which it may sustain, or be required to pay, by reason of such excavation or structure being under or in the street, or being out of repair during his ownership, or by reason of any cover of the same being out of repair or unfastened during his ownership.

SECTION 12. Recovery of Bodies under Fallen Buildings. — In case of the falling of any building or part thereof in the town of Brookline, where persons are known or believed to be buried under the ruins thereof, it shall be the duty of the Fire Department to cause an examination of the premises to be made for the recovery of the bodies of the killed and injured. Whenever, in making such examination, it shall be necessary to remove from the premises any débris, it shall be the duty of the Department of Street Cleaning, when called upon by the Building Department to coöperate, to provide a suitable and convenient dumping-place for the deposit of such débris.

SECTION 13. Should the owner of any building object to any order or decision of the commissioner, on a matter left by this law to his approval or control, and choose a referee to serve as hereinafter provided, within three days after being notified of such order or decision, the matter shall be referred to three referees, who shall be either architects, civil engineers, or master-builders, one chosen by the commissioner, one by the owner, and a third by these two; and the decision thereon in writing of these referees, or a majority of them, shall be final and conclusive.

SECTION 14. Penalty. — Any person who shall build or alter any wall, building or other structure, or part thereof, in violation of any provision of this law, or who shall, after twenty-four hours' notice from the building commissioner, maintain or use any such wall, building or other structure or part thereof, so built or altered, or shall violate any provision of this law, shall be punished by a fine not exceeding one hundred dollars, to be paid into the treasury of the town of Brookline.

SECTION 15. Repeals. — Upon the approval of these by-laws by the Superior Court and their publication according to law, they shall go into effect, and the building laws of the town heretofore existing shall be annulled and repealed.

Adopted at the Adjourned Annual Town Meeting, Brookline, March 31, 1903.

Attest: EDWARD W. BAKER,
Town Clerk of Brookline.

NORFOLK, SS. SUPERIOR COURT.
May 11, 1903.

The foregoing By-Law of the Town of Brookline is approved by the Superior Court, and with such approval is recorded in the office of the Clerk of the Courts of the County of Norfolk.

L. S.

Attest: R. B. WORTHINGTON,
Assistant Clerk.

BROOKLINE, May 20, 1903.

A true copy.

Attest: EDWARD W. BAKER,
Town Clerk.

Town of Brookline.

BUILDING DEPARTMENT.

REGULATIONS

FOR

GAS FITTING.

APRIL 28, 1903.

BROOKLINE, MASS.:
THE RIVERDALE PRESS: C. A. W. SPENCER.
1903.

Commonwealth of Massachusetts.

Chapter 134 of the Acts of 1899.

AN ACT

RELATIVE TO THE LICENSING OF GAS-FITTERS AND THE SUPERVISION OF GAS-FITTING IN THE TOWN OF BROOKLINE.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows :—

SECTION 1. No person, firm or corporation shall engage in the business of gas-fitting or the installation or repair of gas fixtures in buildings in the town of Brookline, and no journeyman shall work at said business in the said town unless licensed therefor in accordance with the provisions of this act; but this section shall not take effect until ninety days after the acceptance of this act by said town.

The word "journeyman," as used herein means one who personally does any gas fitting, or any work in connection therewith, which would be subject to inspection under this act.

SECT. 2. There shall be a board of three examiners selected as follows: The first a member of the board of health, designated by said board; the second, the inspector of buildings in said town; the third, a person holding no other office, to be appointed by the board of health; he shall be a practical gas-fitter of at least five years' continuous experience, lasting up to the time of his appointment. The first and third members shall be chosen within thirty days after the acceptance of this act, for a term ending on the first day of May following their appointment, and thereafter annually. The first and second members shall receive no compensation. The third member shall be paid for his services by the said town at a rate not exceeding five dollars for each day of actual service, and at the same rate for any fraction of a day. The said third member shall be entitled to receive a license under this act without fee or examination. As soon as may be after their appointment the members of the said board shall organize by the selection of a chairman and clerk, and shall designate times and places for the examination of applicants for licenses.

SECT. 3. Any person desiring to engage in the said business, or any person desiring to labor at it as a journeyman, shall make application to the inspector of buildings for a license, and he shall thereupon be examined as to his qualifications by the said board, such examination to include some kind of practical test; and if he be found competent the said board shall so certify to the said inspector, and the said inspector shall issue a license to him; *provided*, that he first registers with the said inspector his name, residence, place of business and license number and pays the license fee.

In case of a firm or corporation the examination and licensing of one member of the firm or the manager of the corporation, shall satisfy the requirements of this act. A license may at any time be revoked by the said board. It shall continue in force until so revoked, but it shall not be transferable.

SECT. 4. The fee for a license under this act shall be two dollars for any employer, firm or corporation, and fifty cents for a journeyman.

SECT. 5. Any person, firm or corporation holding a license under chapter two hundred and sixty-five of the acts of the year eighteen hundred and ninety-seven shall be entitled to receive a license under this act, without fee or examination, upon registering with the inspector of buildings as provided in section three.

SECT. 6. The board of health of said town shall appoint as many inspectors of gas fitting and gas-fixture installation in buildings as they may deem necessary from time to time. The compensation of the inspectors shall be determined by said board of health, subject to the approval of the town, and such inspectors shall hold office until removed by the board of health.

Said inspectors shall inspect all new work relating to gas piping and gas fittings and fixtures in new and old buildings within said town, and shall report to the board of health all violations of this act or of any act, by-law or regulation relating to gas fixtures which now exists or may hereafter be enacted or made, and they shall also perform such other appropriate duties as may be required of them by said board of health. No inspector shall inspect or approve any work done by himself or by any person by whom he is employed or who is employed by him.

SECT. 7. In new work done after the acceptance of this act in said town, gas pipes shall not be covered or concealed from view until they have been approved by one of said inspectors, who shall examine the same within two working days after notice that such pipes are ready for inspection; and such new pipes shall not be used until the same and the fixtures attached thereto have been tested by the person doing the work in the presence of one or more of said inspectors, by some test approved by said inspector or inspectors.

SECT. 8. Every person licensed under the provisions of this act shall display his license number conspicuously at his place of business.

SECT. 9. After the acceptance of this act as hereinbefore provided, no building in said town shall be piped or fitted for gas, and no gas fixtures shall be placed in any building, nor shall any repairs be made upon any such piping or fixtures, unless a permit shall be granted therefor by the inspector of buildings. Applications for such permits shall be made only by persons licensed as aforesaid, and they shall contain a full statement of the situation of the building, the name and address of the owner, of the work to be done and the materials to be used; and, if the inspector so requires, a plan of the work contemplated. It shall be lawful, however, for persons licensed as aforesaid to make necessary repairs without a permit, in the case of leaks or breaks requiring immediate attention; but in such cases a report signed by the person making the repairs shall be filed in the office of the inspector of buildings within forty-eight hours after the repairs were made, stating the nature of the leak or break, and, in detail, the extent of the repairs made and the manner of making the same.

All materials used and work performed under the provisions of this section shall be subject to such regulations as now exist or may hereafter be made by the board of health of said town.

Nothing in this section shall apply to the taking off or replacing of the ordinary gas burner or tip.

SECT. 10. No gas pipe which may be put in any building in said town shall be let into the timbers, beams or girders, unless the same is placed within thirty-six inches of the end of said timber, beam or girder, and in no building shall the pipes be let into the timbers, beams or girders more than two inches in depth. No pipes from which fixtures are to be suspended shall be run on the under side of the timbers, except when the boarding runs diagonally with respect to said timbers, in which case they shall be firmly secured to the timbers. No person shall disconnect or remove any gas meter except the representative of the gas company owning such meter.

SECT. 11. All gas brackets shall be placed at least three feet below any ceiling or wood work, unless the same is properly protected by a shield, in which case the distance shall not be less than eighteen inches. Nothing in this act shall be construed to affect the operations of any gas company upon its own premises, or with respect to its mains or service pipes.

SECT. 12. The board of health of said town may, by said inspectors, from time to time, as it deems proper, inspect the gas fixtures and appliances in any building, and shall make such regulations relating thereto as it deems that the public health and safety require, and the owner of such building shall comply with such regulations.

SECT. 13. Any person violating any provision of this act or any ordinance, by-law or rule or regulation made thereunder, shall be deemed guilty of a misdemeanor, and shall be subject to a fine not exceeding one hundred dollars for every such violation; and if such person has received a license under this act his license may be revoked by the board of health of said town; and if the license is revoked no new license shall be issued to him until the expiration of one year from the date of such revocation.

SECT. 14. The said inspector of buildings shall annually make a full report in detail to said town of all his proceedings under this act during the year, and shall include therein a report of the board of examiners appointed under this act giving their proceedings during the year.

SECT. 15. This act shall take effect upon its passage so far as to allow said town to vote upon the acceptance of the same, but it shall not take full effect until it has been accepted by a vote of two-thirds of the voters of said town voting thereon at a meeting duly called for the purpose.

— Accepted by the town April 14, 1899.

Town of Brookline.

REGULATIONS FOR GAS-FITTING.

Adopted April 28, 1903.

SECTION 1. In all cases of repair of leaks, a notice giving the location and extent of all work performed shall be filed with the Inspector of Buildings immediately upon completion of the same.

SECTION 2. No pipe shall be so laid as to support any weight (except fixtures), or be subjected to any strain.

SECTION 3. All outlets for fixtures shall be securely fastened to the satisfaction of such inspector, all outlets not covered by fixtures shall be left capped, and the number of burners for each outlet shall be marked on the builders' plans.

SECTION 4. Any pipe laid in a cold or damp place shall be properly dripped and protected.

SECTION 5. Every swing bracket shall have a globe or guard to prevent its burner from coming in contact with the wall. All bracket outlets shall be at least nine inches from door or window casings.

SECTION 6. Gas or combination fixtures in all public buildings, theaters and public halls be made safe to the satisfaction of the inspector.

SECTION 7. All stop-pins to keys or cocks or fixtures shall be screwed into place.

SECTION 8. The use of gas-fitters' cement is prohibited, except in putting fixtures together.

SECTION 9. Gas shall not be let on in any building until the work performed has been approved by the inspector. Inside services shall be tested by the fitter who receives the permit to connect the service or meter.

SECTION 10. There shall be a brass straightway cock on the service-pipe close to the foundation-wall, one at the inlet and one at the outlet side of each meter. Valves shall not be used if the service-pipe is less than three inches in diameter, and when used shall be placed close to the foundation-wall and nowhere else.

SECTION 11. There shall be a final test by a gas-fitter of all fixtures and pipes by two inches of mercury, which must stand five minutes; this test to be made in the presence of the gas inspector; the gauge to be made of glass tubing of uniform interior diameter not less than one-eighth inch, and so constructed that both surfaces of mercury will be exposed.

Section 12. All gas pipe shall be of wrought iron, all fittings of malleable iron, and all meter connections of lead pipe of the same size as the fit or riser. Galvanized fittings are prohibited.

Section 13. Brass solder nipples shall be used on all meter connections.

Section 14. No riser shall be left more than five feet away from the front foundation-wall.

Section 15. All buildings shall be piped according to the following scale and properly fastened:—

Iron pipe,	**⅜-inch,**	**26 feet,**	**3 burners,**
“	**½ “**	**30 “**	**6 “**
“	**¾ “**	**50 “**	**20 “**
“	**1 “**	**70 “**	**35 “**
“	**1¼-inches,**	**100 “**	**60 “**
“	**1½ “**	**150 “**	**100 “**
“	**2 “**	**200 “**	**200 “**
“	**2½ “**	**300 “**	**300 “**
“	**3 “**	**450 “**	**450 “**
“	**3½ “**	**500 “**	**600 “**
“	**4 “**	**600 “**	**750 “**
“	**4½ “**	**700 “**	**900 “**
“	**5 “**	**800 “**	**1,050 “**
“	**6 “**	**1,000 “**	**1,350 “**

Section 16. All outlets and risers shall be left capped or covered with fixtures.

Section 17. All service-pipes in cold or damp places shall be painted with two coats of red lead and boiled oil.

Section 18. Gas outlets for burners shall not be placed under tanks, back of doors, or within four feet of any meter.

Section 19. All gas burners less than two feet from a plastered ceiling or less than three feet from overhead wordwork shall be protected by a shield.

Section 20. All brass tubing used for arms or stems of fixtures shall be at least No. 18 standard gauge, and full size outside so as to cut a full thread. All threads on brass pipe shall screw in at least five-sixteenths of an inch. All rope or square tubing shall be brazed or soldered into fittings or distributors, or have a nipple brazed into the tubing.

Section 21. All cast fittings, such as cocks, swing joints, double centers, and nozzles, shall be *extra heavy*. The plugs of all cocks must be ground to a smooth and true surface for their entire length, be free from sand-holes, have not less than three-quarters inch bearing (except in cases of special design), have two flat sides on the end for the washer, and have two nuts instead of a tail-screw.

SECTION 22. Outlets for gas ranges and heaters shall have a diameter not less than that required for six burners, and shall have straightway brass cocks on the service-pipe.

SECTION 23. The use of unions for connection to gas stoves, ranges, or heaters is prohibited, and right and left couplings must be used.

SECTION 24. Pipes in buildings shall be laid above timber instead of beneath them, where it is possible to do so.

SECTION 25. When gas ranges are removed for any cause the pipe must be securely capped or plugged, with a metal plug or cap, *gas tight*.

SECTION 26. No second-hand gas-pipe shall be put into use in any building without the written permit of the inspector.

SECTION 27. Drops or outlets less than three-quarters of an inch in diameter shall not be left more than three-quarters of an inch below plastering, center-piece, or woodwork, and other outlets shall not project more than three-quarters of an inch beyond plastering or woodwork.

SECTION 28. Fastening boards shall not be cut away to accommodate electric wires. All outlets shall be fastened to the satisfaction of the inspector.

SECTION 29. All iron pipes used for piping buildings, all arms, and all items of fixtures, shall be of the kind classed as standard pipe, and shall weigh according to the following table:—

Size of pipe.	Pounds per foot.
⅛-inch pipe	.24
¼-inch pipe	.42
⅜-inch pipe	.56
½-inch pipe	.85
¾-inch pipe	1.12
1-inch pipe	1.67
1¼-inch pipe	2.24
1½-inch pipe	2.68
2-inch pipe	3.61
2½-inch pipe	5.74
3-inch pipe	7.54
3½-inch pipe	9.00
4-inch pipe	10.66

SECTION 30. When brass piping is used on the outside of plastering or woodwork, it shall be classed as fixture.

SECTION 31. No gas-pipe shall be laid within six inches of an electric light wire.

SECTION 32. Wherever spark-lighting or self-lighting burners are used, the mercury test shall be applied to the cocks.

SECTION 33. Gas-pipe on chimney breasts and the like shall be placed back of the studding in all cases.

SECTION 34. All materials employed and work performed in the use of the acetylene gas shall be in accordance with the rules and requirements of the National Board of Fire Underwriters.

SECTION 35. Gas engines must have a separate service from the street, and a separate meter for the same; no connection whatever with the illuminating service. All piping and appliances for gas engines must have a mercury test.

SECTION 36. Heaters of any kind shall not be placed in fireplaces not properly ventilated.

SECTION 37. Pipes in old or finished buildings shall not be placed outside of plaster or woodwork, without the consent of the inspector.

SECTION 38. Gas or combination fixtures in all public buildings, theaters, and public halls shall be made safe to the satisfaction of the inspector of gas-fitting.

SECTION 39. All gas burners used on stage for theatricals shall be properly protected with wire netting.

SECTION 40. All buildings used for assembly or public resort shall have the piping arranged so the auditorium, corridors, offices, stage, and dressing-rooms shall each be under separate control by cocks, placed in a convenient place.

SECTION 41. All buildings, such as schoolhouses, churches, theaters, public buildings, halls, places of assembly or public resort, tenement-houses, boarding-houses or lodging houses, and office buildings shall have placed a sufficient number of gas burners in auditoriums, corridors, passageways, on stage, in dressing-rooms and offices, ready for use at all times.

SECTION 42. Gas service in office, manufacturing, or mercantile buildings must have a cock at the foundation-wall in basement, and one on each floor to control the same, also one at the inlet and one at the outlet of each meter.

SECTION 43. All meters must be in well-ventilated places with no obstruction to them at any time.

SECTION 44. When possible, meters for stores, public buildings, or theaters must set in front basement. When this is not possible, they shall set close to front of building on first floor.

SECTION 45. The access to main cock or meters must not be obstructed by doors, coal, or other material; free access at all times must be had.

SECTION 46. Meters set in cellars or basements of dwellings must be placed within five feet of front foundation-wall, and must have direct ventilation to the street.

SECTION 47. Meters shall not be set in a room or hall used for lodging purposes.

SECTION 48. When meters are removed for any cause, a metal plug must be screwed into the connections, gas tight.

SECTION 49. When a violation of these regulations exists in any building, the inspector shall notify the gas company to shut off the gas, and, if necessary, remove the meter, which shall not be returned until the company has been notified that the violation has been removed.

Town of Brookline

DEPARTMENT OF WIRES AND LIGHTS

BY-LAW AND REGULATIONS

RELATIVE TO

WIRES AND LIGHTS

June 1st, 1903

BROOKLINE, MASS.
THE RIVERDALE PRESS: C. A. W. SPENCER
1903

Commonwealth of Massachusetts.

CHAPTER 166 OF THE ACTS OF 1895.

AN ACT

RELATIVE TO THE REGULATION AND SUPERVISION OF WIRES OVER STREETS OR BUILDINGS IN THE TOWN OF BROOKLINE.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows: —

SECTION 1. Every person or corporation, private or municipal, owning or operating a line of wires over streets or buildings in the town of Brookline shall use only wires that are suitable and strong; shall suitably and safely attach them to strong and sufficient supports and insulate them at all points of attachment; shall remove all wires abandoned for use; shall suitably insulate every wire where it enters a building, and if such wire is other than a wire designed to carry an electric light or power current, shall attach to it at suitable and convenient points in the circuit, calculating to prevent danger from fire, and near the place of entering the building, an appliance calculated to prevent at all times a current of electricity of such intensity or volume as to be capable of injuring electrical instruments, or causing fire from entering the building by means of such wire, beyond the point at which such appliance is attached, and shall suitably insulate every wire within a building when such wire is designed to carry an electric light current.

SECTION 2. Every such person and corporation shall in said town within six months after the appointment of the officer hereinafter provided for, affix at the points of support at which any such wire or cable containing wires is attached a tag or mark distinctly designating the owner or user of such wire or cable. No such tag or mark shall be required for the wires of a street railway company used for the transmission of its motive power, nor for the protection or support of such wires.

SECTION 3. Said town shall, by by-law, designate or provide for the appointment of an officer who shall supervise every wire over streets or buildings in said town, and every wire within a building when such wire is designed to carry an electric light or power current; shall notify the person or corporation owning or operating any such wire whenever its attachments, insulation, supports, or appliances are unsuitable or unsafe or the tags or marks thereof are insufficient or illegible; and shall, at the expense of said town, remove every wire abandoned for use and every wire which after the six months aforesaid shall be unprovided with a tag or mark as hereinbefore required, such expense to be repaid by the owner of such wire; and shall see that all laws, by-laws, and regulations relating to such wires are strictly inforced.

SECTION 4. Said town may recover in an action of contract of the person or corporation owning any such wire as is hereinbefore described any expense which it may have incurred for any removal thereof.

SECTION 5. Any court having equity jurisdiction or any justice thereof, in term time or vacation, may, on a petition of the officer designated or appointed as aforesaid, by any suitable process or decree in equity, inforce the provisions of this act, and may, on such petition, issue an injunction or other suitable process to restrain the use or maintenance or to cause the removal of any wire, post, or other support erected, maintained, or used in violation of this act.

SECTION 6. This act shall take effect upon its passage.

Approved March 27, 1895.

Town of Brookline.

By-Law relating to Wires and Lights.

ARTICLE XIII.

DEPARTMENT OF WIRES AND LIGHTS.

SECTION 1. The department of electric wires and street-lights shall be in charge of a superintendent, who shall be appointed by the Selectmen annually in April. He shall hold office from the first day of May following for the term of one year and until another is appointed in his place. His salary shall be fixed by vote of the town. The Selectmen may at any time remove him. He shall keep a record of the business of his department, and submit to the Selectmen in time for publication in the Annual Town Report a yearly report of such business.

SECTION 2. He shall have supervision of all electric and other wires erected in, upon, over or under any street or building, and of all poles supporting wires or lamps and street-lights, and shall require all persons and corporations owning or operating wires to conform to the conditions and requirements of Chapter 166 of the Acts of the Legislature of the year 1895.

SECTION 3. He shall by virtue of his office be the Superintendent of Fire Alarm Telegraph and Police Signal Systems, and all other electric wire systems now or hereafter owned by the town.

SECTION 4. He may, with the approval of the Selectmen, appoint and remove such assistants as may be necessary for the work to be done, permitted by the appropriation.

SECTION 5. Any person or corporation operating electric or other wires within the town shall, upon request of the Superintendent, furnish him with such information as may be necessary to the faithful and effectual discharge of his duties under this By-law.

SECTION 6. The Superintendent shall have access at all reasonable times to all wires, appliances, and apparatus in the interior of a public building or on private premises, which are intended for carrying an electric light or power current, and no person shall arrange, affix, or change any such wires or apparatus without giving the Superintendent reasonable opportunity to inspect such wires and their arrangement and fixtures before the same are covered or enclosed; and no person shall place such wires in any building in process of construction until all gas, steam, sewer, water, and furnace pipes have been placed in proper position. No person shall connect such wires in the interior of buildings and on private premises with an outside circuit which crosses or runs along, over or under, any street or way of the town, without written permission therefor having been first obtained from the Superintendent.

Section 7. No person or corporation shall attach any wire or line for the transmission of electricity for any purpose, except the lines and wires of the town of Brookline, to any post, except on his own premises or upon other lands with the consent of the owner thereof, nor insert the same into any underground conduit, except with the consent of the owner and by the order of the Board of Selectmen.

Town of Brookline.

REGULATIONS

OF THE

Department of Wires and Lights.

OUTSIDE WORK.

FIXTURES AND OVERHEAD CONDUCTORS FOR ALL SYSTEMS AND VOLTAGES.

POLES.

a. Poles shall not be erected without first petitioning the Board of Selectmen or changed without notifying the Superintendent of Wires.

b. No two lines of poles bearing conductors of a like class should be erected on any street, avenue, or square, and no two lines of poles should be erected on the same side of any street, avenue, or square. Poles must be set in the sidewalk not less than ten inches from the outer side of the curb line, and shall not be located within less than ten feet of any lamp-post, or any other pole, except when they are designed to carry wires on streets running at right angles to each other, nor within less than four feet of any hydrant.

c. All poles now standing or hereafter erected shall be suitably painted and kept in good condition to the satisfaction of the Superintendent of Wires; they shall be stenciled, marked, or branded with the owner's name or initials, at a point not less than five nor more than seven feet from the ground.

d. Each line of poles must be run on one side of the street only, except when it is absolutely necessary to change to the other side; but this can only be done by permission of the Board of Selectmen.

e. Where possible all poles must be uniformly spaced, and of uniform height, and not more than one hundred and thirty-two feet between each. No pole less than thirty-five feet long shall be set in the streets of the town except poles for trolley wires, and must be set not less than six feet in the ground; they must be stepped commencing eight feet from the sidewalk, such steps to be parallel with the edgestone of street. Deviations from the rule may be permitted by the Superintendent of Wires.

f. Extensions must not be made on any pole without the approval of the Superintendent of Wires, and the upper gain and top of every pole set in the streets and carrying wires must be reserved for the wires owned by the town of Brookline.

g. Where cross-arms are designed to carry six or more wires they must be supported with iron braces; they must receive at least two coats of paint and should have some distinctive color to indicate the character of the wires attached thereto, and in addition the owner's name must be painted, stenciled, or branded thereon.

h. Where wires of different ownership occupy the same cross-arm, a tag must be fastened to the same at the insulator, on which is stamped the owner's name or initials, such tags to be made of unoxidizable metal, and securely fastened with wire.

i. Pole brackets must not be used on poles carrying electric wires of any kind; wires must be supported by cross-arms; where necessary a single wire may be supported on pins on the top of poles.

j. No staple, ring, chain, or other device shall be driven in or fastened to any pole for the purpose of hitching horses thereto, without first obtaining permission of the companies, and no person shall deface any pole by the use of linemen's spurs, cutting with a knife, axe, or any other implement.

k. When poles and fixtures have been abandoned by the owners thereof, they must remove them as soon as they discontinue their use unless it is positively known that they will again use them within sixty days. Wires on such poles or fixtures owned by others must be removed unless the owners of such wires assume the ownership of such poles and fixtures, the same to be transferred to them by the original owners, by grant of the Board of Selectmen.

l. Whenever a pole is removed from the street, a report of the same must be sent to the Superintendent of Wires, by those who make such removal.

m. New poles must not be brought on any street more than two days in advance of the time they are to be set, and when old poles are taken down they must be removed from the street the same day.

n. A plan showing the proposed location of all poles set, drawn to scale, must accompany the petition sent to the Selectmen, such plan to be finally drawn and the location of each pole indicated thereon, after such locations have been approved by the Board of Selectmen.

o. All poles and posts used for the support of arc-lamps for street lighting purposes shall be insulated in such a manner as to protect empoyees and other persons against accident, and the method of insulation must be approved by the Superintendent of Wires. Guy wires must be insulated from poles and fixtures by inserting an insulator not less than six feet from points of attachment. Where guy wires are attached to trees, the lag screw or bolt must not be more than one quarter round.

p. Pole brackets must not be used on trees for the support of wires; screw eyes are alone permissible.

q. Wires must not, when running in the same direction, be attached to the upper and under side of the same cross-arm, and the use of so-called hard rubber hook insulators or porcelain knobs will not be permitted for high or low potential conductors.

r. The two conductors constituting the line and return of any circuit for alternating currents must be run parallel to each other, and at a distance apart not less than twelve inches. When wires are brought below the roof of a building, the drops must commence at the top of the same, and run straight down and between and not in front of the windows, hoistways, etc., and as near the wall as the character of the service will permit. All such drop wires designed to carry an electric light or power current must be heavily covered with the best quality of insulation, and that in turn with at least two braids of cotton; and when they are within easy reach of persons from windows, doors, etc., they shall have an approved additional covering or tube as an additional protection to the insulation. The use of so-called "Weatherproof" and "Underwriters" insulation will not be approved for drop wires for services.

s. No wires shall hang less than twenty-five feet from the street or sidewalk at the lowest point of sag. Where sharp angles occur, or where it is necessary to run the wires so that the tendency is to lift from the insulators, guard irons must be used to prevent them from leaving the cross-arms.

t. The Superintendent of Wires will be deemed the sole judge of what constitutes safe and proper construction and insulation of all wires, cables and conductors, fixtures, and appliances, and will make such rules and regulations as he may deem necessary to make such conductors and appliances as safe as possible.

u. Whenever, in the opinion of the Superintendent of Wires, any overhead wires, cables or conductors, poles, or fixtures used for the transmission and distribution of electric current are in an unsafe and dangerous condition, he will cause the current to be shut off, if the existing defects are not remedied in a reasonable time, and such defective wires, cables, or conductors will then be treated as being "dead" and unused, and will be removed by the Superintendent of Wires at the expense of the owner thereof.

TRANSFORMERS.

a. Transformers must not be placed on any fixture on a roof, or any wall rising above a roof. Transformers must not be attached to the outside wall of buildings, so that they can be reached by persons from windows, doors, fire escapes, stairways or the ground. The primary wires should drop to the transformer at right angles to the mains or branches; must be heavily covered with the best grade of insulation, and that in turn with at least two braids of cotton; so-called "Underwriters" or "Weatherproof" insulation will not be approved.

E. N. DAVIS,
Supt. of Wires and Lights.

June 1, 1903.

INTERIOR WIRING

For Electric Lighting and Power.

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1. No wire shall be used which is smaller than No. 14 B. and S. gauge.

2. Not over ten lights are to be placed on any one tap circuit, unless by special permission of the Wire Department.

3. Wires running through woodwork, plaster, etc., other than lamp or switch outlets, must be protected by approved bushings, such as glass, porcelain or iron pipe. Where wires run through brick fire-stops, iron pipe "with an approved insulator on each end" must be used; pipe to project through at least two inches beyond the brick. All bushings must be continuous from one end of hole to the other and must project ½ inch at each end.

4. All wires running in bays must be supported on porcelain insulators not less than 1 inch in diameter by 1½ inches in height, and capable of supporting the wire at least 1 inch from surface wired over. Such insulators to be placed not over 4½ feet apart, and secured with soft washers under heads of nails, and in such manner as to keep the wires *as far apart as possible*, and in no case nearer each other than 3 inches.

5. All wires must be run singly and on separate timbers where possible, and in no case shall two wires of opposite polarity be run one over the other. Where wires are run on top of floor timbers a knob must be placed on every timber.

6. All wires must be secured to the insulators by a complete turn or tie, and at the end of run may be secured by dead-ending.

7. At all outlets the wires must be protected by some approved tubing not less than eight inches long. No wires to be run nearer than three inches to any pipe or other wires unless protected by such tubing.

Porcelain bushings will not be accepted at outlets other than where wires enter cut-out closet.

8. No conduit tube having an internal diameter of less than five-eighths of an inch shall be used, measurement to be taken inside of metal conduit. Every outlet must be equipped with an approved outlet box.

9. All joints must be firmly made, well soldered, carefully wiped to remove all acid or other corrosive substance, covered with a layer of joint compound, and then carefully taped.

10. No other wires shall be run in the same bays in a parallel direction with electric light wires; where such wires cross electric light wires they shall be below and at least three inches from them.

11. Electric light and gas lighting wires will not be allowed on the same fixtures.

12. All buildings must be wired on the three-wire system; the mains to have sufficient carrying capacity for use on two-wire system.

13. All electric, gas lighting, and bell wires run in the same building with electric light wires should be braided office or rubber-covered wire, and separate metallic circuits must be run for the same and operated independent of all piping.

14. At all outlets not provided with gas pipe a substantial backboard not less than ⅞ inch thick must be provided for fixtures. Combination fixtures in cellars with cement floor will not be accepted.

15. All cut-out cabinets must be located in halls or stairways, easily accessible, and lined throughout with asbestos. In flat houses a separate pair of mains must run from each floor to the cellar. Main fuse, jackknife switch, and meter must be located in the cellar within easy reach of a door or window.

16. All wire used must be of such makes and quality as approved by the National Board of Fire Underwriters.

17. Application must be made at least twenty-four hours before the work is commenced. All wires must be inspected before being in any way concealed.

18. In all cases where wiring is not satisfactorily done, the owner will be notified and no current will be allowed turned on until such changes have been made

as are deemed necessary by the inspector. In all cases not covered by these rules the work must be done in accordance with the Rules and Requirements of the National Electric Code.

E. N. DAVIS,
Supt. of Wires and Lights.

June 1, 1903.

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